PSYCHOSOCIAL DETERMINANTS ON ADOPTION OF PREVENTIVE BEHAVIOURS AGAINST HIV INFECTION AMONG SECONDARY SCHOOL STUDENTS IN NJOMBE REGION, TANZANIA

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A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY OF THE OPEN UNIVERSITY OF TANZANIA

2020

CERTIFICATION

The undersigned certify that they have read and recommend for the thesis and found it to be in an acceptable form for examination by The Open University of Tanzania, a thesis titled; ñPsychosocial determinants on adoption of preventive behaviours against HIV infection among secondary school students in Njombe Region, Tanzaniaò, in fulfillment of the requirements for the degree of Doctor of philosophy (Education) of The Open University of Tanzania.

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DECLARATION

I, Apium Lameck Chengula, do hereby declare that this thesis is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award in any University.

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Date

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DEDICATION

This work is dedicated to my beloved parents, the late father Lameck Mwasika Chengula and the late mother Tumete Kambimoja Mgaya. Their appropriate and credible parenting, socialization, education, guidance and counselling enabled the candidate to ascend to this noble education level. The Almighty God rests their souls in eternal peace. Amen.

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ABSTRACT

This study examined psychosocial determinants on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Specifically, the study analyzed perceptions and ecological system variables that influenced on the adoption of preventive behaviours against HIV infection among students. The study was guided by Bronfenbrennerôs Ecological Systems Theory, Quantitative research approach adopting, correlational and cross sectional research design guided the research process. Methods for data collection included questionnaires, documentary analysis and focused group discussion. Sample size of 1000 secondary school students of Njombe region participated in the study. Descriptives statistics, correlation and regression analysis techniques were used to analyze relationship between variables and casual effect. Findings indicated perceived credibility of preventive knowledge against HIV infection; receiving social supportive socialization in schools; accessibility to televisionôs message as determinants to adoption of preventive behaviours. This study concluded that, there was statistically significant relationship between perception, microsystem, exosystem variables and adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania. It is recommended that the increased use of credible preventive knowledge, enhancement of socialization process in school microsystems and accessibility to televisionôs message to be used in preventing HIV infection in secondary schools.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
APA	American Psychological Association
BEST	Basic Education Statistics in Tanzania
COSTECH	Tanzania Commission for Science and Technology
DUCE	Dar es Salaam University College of Education
FBO	Faith Based Organization
FGD	Focus Group Discussion
HIV	Human Immunodeficiency Virus
ICF	Intermidiate Care Facility
MAASP	Master of Arts in Applied Social Psychology
MNMA	Mwalimu Nyerere Memorial Academy
MPH	Master of Public Health
NACP	National AIDS Control Programme
NBS	National Bureau of Statistics of Tanzania
NGO-	Non Government Organization
OCGS	Office of the Chief Government Statistician
ORC	Organisation Resources Counselors.Inc
OUT	Open University of Tanzania
PEPFAR	US: Presidentôs Emergency Plan for AIDS Relief.
RAS	Regional Administrative Secretary
SHEP	School Health Education Program
SPSS	Statistical Package Solution Service
SPW	Student Partnership World Wide

TACAIDS	Tanzania Commission for AIDS
TDHS	Tanzania Demographic and Health Survey
UDSM	University of Dar es Salaam
UNAIDS	United Nations AIDS
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Childrenôs Education Fund
URT	United Republic of Tanzania
VCT	Voluntary Counseling and Testing
WHO	World Health Organization
ZAC	Zanzibar AIDS Commission

CHAPTER ONE

STUDY BACKGROUND AND ITS CONTEXT

1.1 Introduction

This chapter introduce investigation on psychosocial determinants on adoption of preventive behaviours against Human Immune Deficiency Virus (HIV) infection among secondary schools students in Njombe region. In particular the chapter presents background information to the study, statement of the research problem, research objectives and research hypothesis. Other items covered are significance of the study, limitations of the study, and delimitations of the study and operationalization of key variables in this study.

1.2 Background Information to the Study

1.2.1 Psychosocial Determinants on Adoption of Preventive Behaviours against HIV Infections

Psychosocial determinants as preventive behaviours entail social psychology items of perception, microsystem and exosystem variables (Feldman, 1999; Horowitz & Bordens, 1995; Lewis, Daniels & DôAndrea, 2003). In the context of social psychology domain, perception process entails psychological cognition process that involves sensation, analysis, selection, organization, and interpretation of sensory inputs (Feldman, 1999). In the context of this study, the items of perception variable include preventive knowledge against HIV infections. Thus, items of perception variable, determine on adoption of preventive behaviours against HIV infection in school environment systems, for the context of this study, school environments in Njombe regions were studied.

In addition, in the context of Bronfenbrennerôs Ecological systems Theory (Bronfenbrenner, 1988), psychosocial determinants of preventive behaviours entails microsystems which contain schools, families, peer groups, faith based organization such as church or mosque (Berndt, 1997). Also, another psychosocial determinants on adoption of preventive behaviours against HIV infection, includes exosystems. The inputs include electronic media such as television and print media such as news papers (Berndt, 1997; Horowitz *et al.,* 1995; Lewis *et al.,* 2003). In the context of this study perception, microsystems and exosystems variables were predicted to determine on adoption of preventive behaviours against HIV infection in secondary schoolsô microsystems.

1.2.2 Preventive Education against HIV Infection

Preventive knowledge was accepted to be the main psychosocial determinant on adoption of preventive behaviours, such as using voluntary counselling and testing (VCT) services across the world (UNESCO, 2001). However, the rate of adoption of preventive behaviours against HIV infection was still very low, particularly among youth in and out of schools (Lugoe, 1996; Sanga, Kapinga, Msuya & Mwanga, 2015). Thus, the insufficient adoption of preventive behaviours against HIV infection among youth stimulated the need to investigate the psychosocial determinants on adoption of preventive behaviours against HIV infection especially among secondary school students.

Moreover, according to The United Nations, Educational, Scientific and Cultural Organization (UNESCO), 2001, and World Health Organization (WHO), 1989, there have been global efforts to fight HIV infection since 1980^{s}. International agencies,

Governments, Non-Government Organizations (NGOôs); Faith Based Organizations (FBOôs), health care agencies and schools have joined hands to fight HIV/AIDS. Studies have reported significant achievement of high level awareness about HIV prevention knowledge among youth including secondary school students (Danjin & Onajole, 2010; Enahoro, Abah, Okoedion & Orjiakor, 2015; Fisher, Eke, Cance, Hawkins & Lam, 2008; Michielsen *et al.,* 2012b). Also, Nketiah-Amponsah & Afful-Mensah (2013); Odusanya & Bankole (2006) have reported significant achievements in and out of schools, regarding universal high awareness and knowledge about HIV prevention methods among youth.

However, the increase in knowledge has not been translated into real practice. Despite comprehensive and strong efforts to educate the public including students in schools about adoption of preventive behaviours against HIV infection, only few youth adhered to adoption of preventive behaviours. Studies reveal that most youth persistent practicing HIV risk related behaviours including alcoholism and having multiple sexual partners (Ekuri, Asuquo & Uwe, 2009). These situations stimulated a challenging question as what are psychosocial determinants that influence adoption of preventive behaviours against HIV infection among youth particularly secondary school students.

1.2.3 Social Psychology Domain in the Context of HIV Prevention

This study was guided by social psychology domain. This is a scientific discipline that examines and elaborates individualôs thoughts, feelings and social behaviours influenced by the actual or imagined interaction and relationship with other people individually or in groups of people (Myers, 2008). Again, psychological social

psychology explores and seeks to elaborate individualôs social thinking, social influence such as persuasion, social relationship between independent variable and dependent variable in natural settings.

Furthermore, psychological social psychology examines the application of social psychology knowledge in combating psychological challenges such as preventing HIV infection in real natural settings (Franzoi, 2000; Horowitz *et al.,* 1995; Myers, 2008). The natural settings include microsystems such as schools, families, peer groups and faith based organizations including churches and mosques. In the context of the study perception, microsystems and exosystems use social behaviour powers to influence determinants on adoption of preventive behaviours against HIV infection. The founders of psychological social psychology included Gordon Allport (Horowitz *et al.,* 1995) and Lewin (1936).

In particular, psychological social psychology domain guided the study. The psychological social psychology focused on the analysis of social behaviours of the individual human being (Franzoi, 2000). The individuals, such as secondary school students were hosted and investigated in the context of the social ecological settings such as microsystems, particularly, schools. In this research report, the individual secondary school studentôs interaction into the microsystems was guided by the Bronfenbrennerôs Ecological System Theory (Bronfenbrenner, 1988).

1.2.4 HIV Prevention Services in the Perspective of Bronfenbrenner's Ecological Systems Theory

In the framework of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner,

1988), microsystem is an immediate setting in which the individual live, get basic human needs, directly interact and most influenced by the microsystem ecological forces. The components of the microsystems include schools, families, peer groups, church, mosque and work place. The microsystems such as schools significantly, directly and impact prevention activities in levels of the ecological systems (Berndt, 1997; Newman &Newman, 2003).

Moreover, at the microsystem level, the school systems enhance the delivery of preventive education to the adolescent learners such as secondary school students. The school proactively provides awareness on preventive knowledge aimed to prevent the youth from engaging into risk behaviours such as alcoholism that could lead the individual to HIV infection. The school focus on building competence skills proactively to empower the youth to avoid risk behaviours such as alcoholism, related to HIV infection in school settings (Lewis *et al.,* 2003). Also, the school used its powers such as dramatic presentation of knowledge leading to encourage the adolescents to adopt preventive behaviours such as avoiding alcoholism, drug abuse and adopting sexual abstinence against HIV infection among secondary school students in school settings in Njombe region.

In addition, in the framework of microsystems, the school enhance life skills training programmes that are inculcated into the youthôs mind in secondary schoolôs settings. Life skills refer to psychosocial competences that enhance the individualôs natural ability to realize individualôs productive life and competence skills in the challenging ecological systems (Lewis *et al.,* 2003). As a result, life skills facilitate the individualôs power to combat risk behaviours such as alcoholism that could lead to

HIV infection among young people in secondary schools.

Similarly, the life skills among adolescents in secondary schools includes individualôs ability to develop health life styles, gain proficient correct decision making skills, develop good life planning skills, good time management, and health promotion skills (Lewis *et al.,* 2003). Also, life skills entails developing and utilizing positive sense of self-esteem, self- efficacy (Bandura, 1986), self- management skills and having coping strategies that is used in combating stressful psychological events (Nelson-Jones, 1988, 2001& 2004). As a result, these life skills enhance adoption of preventive behaviours such as avoiding alcoholism to escape HIV infection among secondary school students.

Another significant life skills practiced by secondary school adolescents included adherence to correct norms, values and beliefs regarding relationship with microsystems components such as peer groups, families, schools, church or mosque. Other recommended life skills includes skills for building resistance to alcoholism and drug abuse, drug prevention skills and alcoholism prevention skills (Dalton *et al.,* 2007). Likewise, a school enhance teaching and learning skills such as self-awareness, social awareness, discipline, self management skills, positive relationship skills, self- decision making skills, self independent skills, seeking and adherence to health behaviours skills and commitment skills (Dalton *et al.,* 2007). As a result, adherence to these competencies skills leads to better academic performance and good success in school and life activities. Hence, these competencies and life skills determine and facilitate on adoption of preventive behaviours against HIV infection among secondary school students.

1.2.5 Preventive Behaviours against HIV Infection in Secondary Schools in Tanzania

HIV preventive behaviours refer to psychological actions adopted by the individual to enhance avoidance of any mode of HIV transmission, leading to avoid HIV infection. HIV preventive behaviours facilitated young people to avoid HIV infection among secondary school students (Lugoe, 1996). Also based on the Theory of Planned Behaviour (TPB), HIV preventive behaviours were conceptualized in the framework of four elements:

These are action, target, context and time variables (Lugoe, 1996). Every preventive behaviour is an action, happens with regard to a particular target, into a given context and a given time factors leading to a particular preventive behaviour against HIV infection (Lugoe, 1996). The change of any variable, which is action, target, context and time bound, can alter the status of a given health preventive behaviour against HIV infection among secondary school students in school settings.

HIV infection was mostly contributed by the heterosexual transmission. As documented by Lugoe (1996), in Tanzania, HIV preventive behaviours would mostly correlate with practicing safer sexual relationship among students in secondary schools settings. Therefore, HIV preventive behaviours with regard to elements of action, target, context, time and preventive information/ Knowledge includes: Adherence to adoption of preventive knowledge against HIV infection guided by the Bronfenbrenner Ecological System Theory (Bronfenbrenner, 1988; Lewis, *et al.,* 2003). However sexual behaviours are socially and legally sanctioned in secondary schools among students.

Also, other HIV preventive behaviours against HIV infection includes adherence to sexual abstinence, delaying sexual debut, seeking and adherence to HIV voluntary counselling and testing (VCT) services, avoiding alcoholism and drug abuse practices, health care seeking behaviours, seeking diagnosis and treatment of sexually transmitted infection (STI), testing blood and blood products before transfusion, avoiding multiple sexual partners , adherence to moral behaviours and discussing about HIV preventive measures (Biswalo, 1996; Chacha & Bowers, 2005; Dalton, *et al.,* 2007; Lewis, *et al.,* 2003; Lugoe, 1996; Taylor, 2003).

In the framework of the Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988), preventive behaviours involves students adherence to the protective credible preventive knowledge against HIV infection. Also, adherence to credible and moral accepted microsystems such as credible families, school, church, mosque, peer groups and credible exosystems such as approved ethical television programmes, radio programmes and news papers.

In the context of Bronfenbrennerôs ecological systems theory (Bronfenbrenner, 1988), in Tanzania, the systems and communities involved in delivering prevention services against HIV infection included schools, peer groups, health care systems, church/mosque and sportsô clubs. These systems belonged to microsystems. These systems delivered HIV preventive education, VCT and spiritual counselling (Lugoe, 1996). HIV preventive information involved sexuality and religious issues that are sensitive and confidential in African traditional culture. Thus, the introduction of HIV preventive education in schools in Tanzania was negatively perceived by some

microsystems such as families, schools and faith based institutions as accelerating unconventional behaviours such as unauthorirized sexual practices among youth in secondary schools, in Tanzania (Lugoe, 1996).

However, while there was ethical critique about the participation of schools in delivering HIV preventive education, schools and teachers were still perceived as the most powerful force in enhancing acquisition of preventive knowledge, attitudes, beliefs and practice, community values, norms and code of ethics, life skills and natural social power to shape and nurture the social behaviours of individual learners (Freire, 1968; Nyerere, 1966, 1967, & 1968). Increased delivery of prevention knowledge in secondary schools was expected to trigger significant behavioural change leading on adoption of preventive behaviours, against HIV infection among secondary school students in Tanzania. Hence, it was imperative to examine psychosocial determinants on adoption of preventive behaviours against HIV infection among secondary schools school students in Njombe region, Tanzania.

Adoption of Preventive Education against HIV infection among Secondary school students: Preventive education, as a psychological knowledge and skill that is used to identify, prevent and combat the psychological HIV risk behaviours before it occur. The clients such as young people in secondary schools proactively gained preventive education through direct microsystemôs services (Lewis *et al.,* 2003). The preventive knowledge pertained to sharing preventive psychological knowledge and skills that enhance the clients to proactively, independently combat the HIV risk behaviours before it arise (Lewis *et al.,* 2003).

In addition, the clients learnt intervention experiences that proactively empower the individual to adopt the health preventive behaviours such as using VCT services to avoid HIV infection among students in secondary schools. Also, the individual in good health but is at risk of HIV infection, proactively gain preventive knowledge that enhance to avoid HIV risk behaviours such as alcoholism and drug abuse. Practically, through participation in preventive education programmes the members of the microsystem such as schools, gained new competencies knowledge and skills that enhanced the clients to proactively realize and adopt the health preventive behaviours such as avoiding alcoholism and drug abuse, against HIV infection among young people including secondary school students in school settings in Njombe region, Tanzania.

Similarly, preventive education programmes, enhanced the students in school settings to gain life skills that facilitated adoption of preventive health behaviours against HIV infection among secondary school students in Njombe region. The life skills adopted includes correct life planning skills, correct decision making skills, health care seeking skills, self management skills and resource management skills as documented by (Lewis *et al.,* 2003).

Also, through voluntary preventive education programmes, the individual client and groups increased their awareness leading to develop competences skills that enhance the clients to effectively and independently combat psychological challenges such as HIV infection in school microsystems settings in Tanzania. Moreover, preventive education programmes, aimed at delivering preventive knowledge that enhanced the youth to build competencies that lead to combat psychological problems such as

alcoholism behaviour likely to happen. The youth were encouraged to participate in identification, planning and implementation in delivering preventive education services and life skills. Teaching and learning techniques used dramatic presentations that encouraged teenagers to discuss about issues that are perceived important to the youth. The issues that attracted the youth pertained to sexuality, pregnancy, sexually transmitted infections, HIV infection, alcoholism, drug abuse and life skills, significantly empowered the studentôs clients to adopt preventive behaviours against HIV infection particularly in secondary schools settings such as those in Tanzania.

Attending VCT services among Secondary school students in Tanzania: Voluntary Counselling and Testing Services (VCT), refers to proactively delivery and uptake of preventive counselling services to health clients to combat HIV infections (Lewis *et al.,* 2003). Voluntary counselling and testing is an important universal tool that has been used to combat HIV infection all over the world. That, various National and International agencies asked all clients to use VCT services as a valid and reliable tool for combating HIV infection particularly among students in schools who are at risk to the infection.

In the year 2007/08, according to the Tanzania HIV/AIDS Malaria indicator survey, analysis by sex and age indicated that, youth who ever tested HIV and received results of the last HIV test were as follows: Females with age of 15-24 years scored 33.1% while males with the same age of 15-24 years scored 19.1% (Tanzania Commission for AIDS (TACAIDS), Zanzibar AIDS Commission (ZAC),National Bureau of Statistics of Tanzania (NBS), Office of the Chief Government Statistician

(OCGS & Marco International inc), 2008). These figures included both in school and out of school youth in Tanzania including Njombe region.

These figures indicated very low uptake of the preventive behaviours such as VCT services against HIV infection among adolescents including secondary school students in Njombe region, Tanzania. Thus, these figures attracted a need to conduct a study that examined the psychosocial variables that determined process of adoption of preventive behaviours such as VCT services among secondary schools students in Tanzania. Similarly, in the year 2010, an International study conducted by the NBS and Intermediate Care Facility (ICF) Marco, analysis by sex and age indicated that, youth who ever tested HIV and received results of the last HIV test were as follows: Female youth with age of 15-19 years scored 35.4%, while male youth with same age of 15-19 years scored 15.1%. Also, female youth with age of 20-24 years scored 40.1% where as male youth with similar age scored 31.1% (NBS- Tanzania and ICF Marco, 2011).

These figures included both youth in and out of schools in Njombe region and entire Tanzania. Also, these figures indicated low uptake of the HIV voluntary Counselling and Testing (VCT) services among the youth in and outside schools in Njombe region and other regions in Tanzania. Analysis by sex indicated that femaleôs youth used VCT services more than male youth. Also, older youth utilized VCT services more than younger youth. Thus, sex and age are significant determinant factors that influenced process of uptake of VCT services among youth in Tanzania, in and out of schools.

In addition, during the year 2007/08, in Tanzania, data analysis by sex and education revealed that, the youth who ever tested HIV and received results of the last test were as follows: Female youth with no formal education scored 25.3 % while male youth with no formal education scored 16.3%. Also, female youth with incomplete primary education scored 25.7% where as male youth with incomplete primary education scored 17.3%. Again, female youth with complete primary education scored 43.2% as compared to male youth with complete primary education who scored 28.5%. Lastly, female youth with secondary education and above scored 49.3% as compared to male youth with secondary education and above who scored 41.5% (TACAIDS *et al.,* 2008).

Furthermore, the figures presented in the previous paragraph, indicated that, education variable was a strong determinant factor that activated increased rates uptake of VCT services among youth in Tanzania. The figures indicated a trend of increased uptake of VCT services depending upon increased level of formal education of the young clients in Tanzania. These figures included both youth in schools and out of school settings (TACAIDS *et al.,* 2008).

However, the presented percentages figures indicated low uptake of VCT services among the youth as compared to high preventive knowledge against HIV infection possessed by the youth in Tanzania, also at National and International level which is over 90% (NBS Tanzania and ICF Marco, 2011; TACAIDS *et al.,* 2008). It is this discrepancy gap between youthôs possession of high level of preventive knowledge versus low uptake of VCT services that attracted the need and attention to conduct this study to examine the psychosocial determinants that influenced on adoption of

preventive behaviours such as VCT against HIV infection among secondary school students in Njombe region, Tanzania.

Likewise, according to the Tanzania Demographic and Health Survey, in the year 2010, data analysis by sex and education revealed that, in Njombe region and entire Tanzania the youth who ever tested HIV status and received result of the last test were as follows: Female youth with no formal education achieved 28.5% where as male youth with no formal education achieved 10.3%. Also, female youth with incomplete primary education achieved 32.0% as compared to male youth with incomplete primary education who scored 12.3%. Also, female youth with complete primary education achieved 40.3% while male youth with the same level of education that is complete primary education scored 26.0%. Lastly, female youth with secondary education and above utilized VCT services by 50.2% as compared to male youth with similar level of education, that is, secondary education and above who utilized VCT services by 39.1% (NBS-Tanzania, *et al.,* 2011). The analysis of the figures indicated low uptake of VCT services particularly among male youth.

However, the studies conducted previously (NBS *et al.,* 2011; TACAIDS, NBS & Organization Resources Counsellors, Inc (ORC), Marco, 2005; TACAIDS *et al.,* 2008) insufficiently analysed reasons for low uptake of VCT services among youth in Tanzania, compared to high level of preventive knowledge about HIV/AIDS modes of transmission and prevention, possessed by the youth into and outside schools. Thus, the negative correlation between high levels of knowledge about HIV prevention versus low uptake of preventive behaviours such as using VCT services,

against HIV infection among the youth in schools attracted the need to conduct this study to examine the psychosocial determinants on adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania.

Moreover, analysis by sex and regionôs background indicated that, in the year 2007/08 in Iringa region including Njombe region; 49.1% female clients ever tested HIV status and received results, while 28.6% male clients ever tested HIV status and received results on HIV infection status (TACAIDS *et al.,* 2008). These figures indicated low uptake of VCT especially among male residents of Njombe region. Furthermore, in the year 2010, analysis by sex and geographical zone background, conducted by the Tanzania Demographic and health survey, indicated that, the southern highland Zone, including Njombe region in Tanzania; 35.2% female clients ever tested HIV status and received their results. On the other hand, 23.5% only male clients tested HIV status and received their HIV infection results status in the Southern Highlands zone, in Tanzania (NBS *et al.,* 2011). Revealing low uptake of VCT services. Particularly, among male youth with age of 15-24 years in the Southern Highland zone in Tanzania.

Therefore, in the framework of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988), the reported figures about low uptake of preventive behaviours such as VCT, triggered the need to conduct a scientific study that examined the psychosocial determinants on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Avoiding risk Behaviours that lead to HIV infection among youth: HIV risk behaviours refer actions that expose the people to HIV infection. These risk behaviours includes alcoholism, drug abuse, multiple sexual partners and failure to use protection facilities such as condom. Alcohol and drug abuse produce chemicals that when used, impair peopleôs mental process leading the brain to fail to make correct decisions (Mbatia & Sangiwa, 1996).

In addition, drinking alcohol and drug abuse among students in secondary schools cause the students to fail to adhere to the preventive behaviours against HIV infection such as sexual abstinence. As a result, students continue practising HIV risk behaviours despite having high level percentages of awareness of preventive knowledge against HIV infection in secondary schools (Lugoe, 1996; Mbatia, *et al.,* 1996). Similarly, the factors that force youth to engage into HIV risk behaviours have been reported to include, peer group pressure that lead the young people to conform to peer groupôs norms. Also, family groupôs influence, lead the young people to imitate from their family members. As a result peer group influence the youth to engage into risk behaviours such as alcoholism, drug abuse and multiple sexual partners (Newman & Newman, 2003).

Moreover, cultural influence forces the secondary school students to practice alcoholism behaviour, including drug abuse. Thatôs, local alcohol was produced and used in traditional ceremonies performed by familiesô ecological systems. The youth use local alcohol beverages in their families (Mbatia *et al.,* 1996). As a result of family groupôs influence the youth including students in secondary schools, drink local alcohol, distilled alcohol such as beer and wine.

The alcoholism and drug abuse force the young people to engage into HIV risk behaviours such as unprotected risk sexual behaviours despite of having high level of preventive knowledge against HIV infection in secondary schools in Njombe region. Therefore, to rescue the youth in secondary schools in Njombe region and entire Tanzania, it was important for these young people to adopt and practice preventive behaviours against HIV infection in secondary schoolsô ecological systems. The preventive behaviours include sexual abstinence, use of VCT services, avoid alcoholism and drug abuse among the youth in and out of schools in Tanzania.

Furthermore, in Tanzania, studies have revealed that secondary school youth posses high level of knowledge of preventive behaviours against HIV infection. However, some studies reported youthôs low adoption of preventive behaviours against HIV infection such as low uptake of VCT services. As a result, in school youth persistent practicing HIV risk behaviours such as alcoholism and multiple sexual practices leading to increased HIV infection prevalence among youth in schools as reported by various studies (Kabote & Niboye, 2012; Kamala & Aboud, 2006; Kigombolar & Gotora, 2005; Lugoe, 1996; Maswanya *et al.,* 1999; Mmbaga, Leonard & Lyena, 2012; Mwani, 2011; Sanga, Kapinga, Msuya &Mwanga, 2015).

In Njombe region, Tanzania, the level of understanding HIV preventive knowledge among in-school youth and other residents was reported to be high. Despite Njombe regionôs participation in several HIV intervention programmes and high level awareness of preventive knowledge, the region still reported high HIV/AIDS infection prevalence rates of 13.4% in 2003/04 year (TACAIDS, NBS & ORC

Marco, 2005). In the year 2014 Njombe region reported a high HIV infection prevalence rate of 14.8% compared to other regions in Tanzania (URT, 2014c).

Similarly, during that period the delivery of preventive knowledge against HIV/AIDS infection in schools was given priority on the assumption that ignorance of HIV was seen as a significant risk factor among students. Thus, increased prevention knowledge in Njombeôs secondary schools was expected to trigger significant behavioural modifications changes leading to adoption of preventive behaviours against HIV infection among students in Njombe region but in vain. Hence, it was imperative to critically examine psychosocial determinants on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

1.2.6 HIV Challenge among Young People

The first case of HIV/AIDS in Tanzania was reported in 1983 (Nyamuryekungôe, 1991).The third Tanzania HIV/AIDS and malaria indicator survey (2011-2012) indicated that 5.1% of Tanzanians aged 15-49 years including secondary school students in Njombe region, Tanzania, were HIV positive. The prevalence rates was higher among women (6.2%), than men (3.8%) (URT, 2013). Also, The HIV situation in Tanzania prompted various NGOs and Ministries to initiate delivery of preventive education in various schools in Njombe region (URT, 2000; 2001; 2002; 2004). Njombe region was involved in implementation of International and National prevention programmes such as School Health Education Program (SHEP) and HIV prevention programme supported by the Student Partnership World Wide.

Selected secondary schools in Njombe region participated in the programmes; the schools included Makambako, Mpechi, Njombe and Uwemba secondary schools. The level of understanding of HIV preventive knowledge among in school youth in Njombe region was reported to be high as follows: Mwani (2011), reported that in Njombe region, students have high awareness of HIV/AIDS transmission and prevention. However, some students still practiced HIV risk behaviours such as having multiple sexual partners by 32.9% (N = 240). Also, this study Mwani (2011) added that, there was no significant correlation between studentôs level of awareness of HIV/AIDS transmission and prevention versus changes of risk sexual behaviours among secondary school students in Njombe region, Tanzania.

However, despite Njombe regionôs participation in several HIV intervention programmes and high level awareness of preventive knowledge, the region still reported high HIV/AIDS infection prevalence rates of 13.4% in 2003/04 years (TACAIDS, NBS & ORC Macro, 2005). Also, in the year 2007/08 Njombe region still reported high HIV/AIDS infection prevalence rates of 16% compared to other regions in Tanzania (TACAIDS, ZAC, NBS & OCGS and Macro international Inc, 2008).

In 2014 year, Njombe region reported high HIV infection prevalence rate of 14.8% compared to other regions in Tanzania (URT, 2014a). Also, in 2016/17 year, Njombe region reported the highest HIV infection prevalence rate of 11.4% at National level in Tanzania. Most of these prevalence rate composed of the young people such as students in secondary schools in Njombe region (NBS *et al.,* 2016 / 17).

This concern of high HIV infection rates in Njombe region prompted the researcher to target Njombe region as a catchment study area. The ecological systems that were used in deliverance of prevention services against risk behaviours that lead to HIV infection included schools, families, peer groups, health care systems, church/mosque and sportôs clubs. These systems host the young people for longer duration and sustain direct interaction among youth and most powerful ecological systems. The other settings were television, radio broadcasts, internet services and print media. Such systems delivered HIV preventive education, VCT services and spiritual counselling services. The media settings were used because was accessible to most young people in schools and families.

However, despite increased delivery of preventive knowledge in schools, students persists practised HIV risk behaviours such as alcoholism and multiple sexual partners in Njombe region (Mwani, 2011). Therefore, triggered needs to examine psychosocial determinants on adoption of preventive behaviours against HIV infection, among secondary schools students in Njombe region, Tanzania.

1.2.7 HIV Primary Prevention Efforts

This implies psychological intervention services given proactively to entire health clients to prevent psychological problems such as alcoholism which lead to HIV infection (Lewis *et al.,* 2003). Also, primary prevention promoted competencies of the individualôs clients who were at risk of psychological problem such as engaging into drug abuse and multiple sexual partnersô behaviours that could lead to HIV infection in secondary school settings. In this study, prevention pertained adoption of safety behaviours, such as sexual abstinence before HIV infection attack the

individual client.

Caplan (1964) reported that primary prevention, as psychological activity, intended to reduce incidences of occurrence of the psychological problems in the group settings such as secondary schools. The prevention targeted at health client individuals without psychological problems, but is at high vulnerable risk of developing psychological problems such as alcoholism and drug abuse that could lead to HIV infection among youth in secondary schools. Also, primary prevention aimed to lower the rate of new cases, reduced incidences and prevalence rate of the psychological problems such as drug abuse that could lead to HIV infection among secondary school students. Prevention intervenes to stop harmful circumstances before they happen and create hazards to the clients (Bloom, 1996; Dalton *et al.,* 2007).

In addition, primary prevention services intervened to reduce potentially harmful ecological settings before they initiated psychological problems. For example, primary prevention proactively delivered preventive education; instilled knowledge of prevention against HIV infection among secondary school students in Tanzania. Also, proactively primary prevention delivered social skills and life skills such as correct decision making skills, life planning skills and health seeking behaviours. As a result, the life skills and preventive knowledge enhanced the young people in schools to increase level of adoption of preventive behaviours such as sexual abstinence, avoiding alcoholism and drug abuse against HIV infection among secondary school students in Njombe region and other regions in Tanzania.

In the context of Bronfenbrennerôs Ecological Systems Theory (Lewis *et al.,* 2003), the reported primary prevention knowledge targeted to stop incidences of new dysfunctions from attacking a health client but they are at risk, while simultaneously increasing protective factors. Primary intervention was a multidimensional construct. Primary prevention was synonymous to primary preventive VCT that focused on lowering the incidence of emotional problems and promoting positive mental health among healthy but at risk clients (Lewis, *et al.,* 2003). Coyne (1994) reported the following qualities of the primary prevention knowledge: It was delivered proactively before the psychological problems occur; target health clients but are at risk to be attracted by the psychological problems such as HIV infection. Primary prevention implemented to stop the incidence of new dysfunctions from occurring among specific groups of clients. It is group- oriented and population based, but accommodate individual clients.

In the framework of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988**)** primary prevention, included schools, families and other at risk microsystems such as peer groups. Also, primary preventionós qualities includes aim to reduce risk factors such as emotional difficulties, low self esteem and low performance in formal activities such as examinations in secondary schools. These risks ought to be prevented to protect the clients against frustration, stress and anxiety that could lead to HIV infection among secondary school students (Lewis, *et a l.,* 2003).

In addition, primary prevention was ecologically and systematically focused and functioned within the interacting mesosystems such as schools, families, faith based organisations, peer groups and work places. Primary prevention service was

culturally sensitive and valid leading to adhere to groupôs cultural norms, beliefs and practices of the microsystems within the group including secondary schools. The primary prevention concerned with social justice and included at risk groups of people from diverse cultural, ethnic and racial categories.

Primary prevention is educative and collaborative in nature. As a result education is the primary tool of intervention. Lastly, primary prevention focuses on empowerment and systematic change of ecological systems in the framework of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988**).** Thus, preventive education was used as tool to promote competence skills to individual client and groups of schools before psychological threat occur. The empowerments proactively prepared the client and groups to independently combat psychological problems such as drug abuse before it occur (Coyne, 1994).

Furthermore, the primary prevention psychological services delivered by the health care systems in schools in Tanzania, ensured availability of treatment drugs, equipments, testing blood and blood products before transfusion, providing preventive persuasive information through radio broadcast which seemed to be relatively accessible, valid, reliable, efficient and cheaper compared to other mass media such as television and news papers (Lugoe, 1996). That television media was expensive while news papers were more likely to be obtained in urban areas only (Lugoe, 1996).

Also, primary prevention knowledge facilitated students in secondary schools to adhere to sexual abstinence, non alcoholism and avoid drug abuse, health seeking

behaviours, attending VCT services, diagnosis and treatment of Sexual Transmitted Infections (Kourtis *et al.,* 2006). Other primary prevention services provided to secondary school students in Tanzania were: introduction of school health education programme (SHEP). Provided prevention HIV/AIDS education and counselling to youth in secondary schools (URT, 2000; 2002), provided prevention education on HIV/AIDS and life skills learning services in secondary schools (URT, 2004) and training school counsellors. Lastly, secondary prevention services and tertiary prevention services as reported by (Dalton *et al.,* 2007; Orford, 1995) delivered in secondary schools in the framework of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988).

1.3 Statement of the Research Problem

Intensive efforts have been made to inculcate adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, since the year, 1983, when HIV arised in Tanzania (Nyamuryekungôe, 1991). The preventive psychological services were categorized into three clusters namely: Primary prevention intervention services that provided preventive education to health clients proactively before the psychological problem occurred. Secondary prevention intervention services that provided intervention services to clients who indicated early symptoms of developing a psychological problem.

Tertiary prevention intervention services, offered to clients who already attacked by the psychological problem such as alcoholism, drug abuse and multiple risk sexual practices leading to HIV infection as documented by (Bloom, 1996; Dalton, *et al.,* 2007; Orford, 1995). Preventive education against HIV infection was provided to

prevent ignorance about HIV infection that was predicted to contribute to HIV infection. However, despite serious effort to deliver HIV prevention services, some youth including secondary school students, still failed to adopt and practice the preventive behaviours against HIV infection, such as using VCT services.

The preventive behaviours inculcated into the studentôs mind included adherence to sexual abstinence, attending VCT services, non alcoholism and avoiding drug abuse leading to avoid HIV infection among students. Various studies revealed youthôs possession of high level of preventive knowledge and awareness on HIV infection (about 80 - 99.6 %) with regard to preventive behaviours against HIV infection among secondary school students as reported by various studies (Kabote *et al.,* 2012; Kamala *et al.,* 2006; Kigombolar *et al.,* 2005; Maswanya *et al.,* 1999; Mmbaga *et al.,* 2012; Mwani, 2011; TACAIDS *et al.,* 2005; 2008 & URT, 2013).

On contrary, other studies reported insufficient adherence to the adoption and practice of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, as reported in the following documents (Masanja & Msuya, 2014; NBS- Tanzania *et al.,* 2011; Plummer *et al.,* 2006; Sanga *et al.,* 2015; TACAIDS & United Nations AIDS (UNAIDS) , 2010). The percentage of youthôs high awareness on HIV prevention knowledge has not matched the expected desirable adoption and practices of preventive behaviours against HIV infection among secondary schools students in Njombe region. As a result, the youth in schools persistently practiced HIV risk behaviours such as having multiple sexual partners, alcoholism and drug abuse in secondary schools in Njombe region (Mwani, 2011).

The negative correlation between possession of high level percentages of HIV prevention knowledge and low process on adoption of preventive behaviours against HIV infection among youth especially secondary school students was the main challenge that this study intended to examine to understand the psychosocial determinants on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania (NBS Tanzania *et al.,*2011;Sanga *et al.,*2015;TACAIDS *et al.,*2010).

The reported studies insufficiently explored perception and ecological variables as determinants of the adoption of preventive behaviours against HIV infection among secondary school students (Mwani, 2011; Masanja & Msuya, 2014). However, preventive behaviour against HIV infection, need to be investigated. This was the challenge which this study intended to investigate using Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1979; 1988) to explore whether perception, microsystem and exosystem independent variables determined adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania. The present study intended to respond to the following question. What were the psychosocial determinants on adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania?

1.4 General and Specific Research Objectives

1.4.1 General Research Objective

This study investigated how psychosocial determinants influenced adoption of preventive behaviours against HIV infection among secondary school students in

Njombe region, Tanzania.

1.4.2 Specific Research Objectives

In particular this study intended to:

i. Examine the contribution of perception variable on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

ii. Analyze the contribution of microsystem variable on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

iii. Synthesize the contribution of exosystem variable on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

1.5 Research Hypotheses

This study was guided by three hypotheses:

H_{01}. There was no statistically significant relationship between perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

H_{02}. There was no statistically significant relationship between microsystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

H_{03}. There was no statistically significant relationship between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

1.6 Significance of this Study

The findings of this study have added understanding of HIV prevention among specific groups such as youth in secondary schoolsô microsystems. Also, the study added practical findings that compliment National efforts on HIV/AIDS prevention in secondary schools in Tanzania (URT, 2009) .This study has generated data and correct understanding on components of perception, microsystem and exosystem determinants that influenced adoption of preventive behaviours against HIV infection among students in secondary schools in Njombe region.

The data generated included powers of microsystems such as schools, families, peer groups, church/ mosque faith based institutions and health care systems. Also, the study generated data that indicate powers of perception, microsystems, and exosystems variables in determining and fostering the adoption of preventive behaviours against HIV infection in secondary schools in Njombe region. These data can help policy makers, policy implementers, researchers and academicians to review and formulate more current effective strategies to prevent HIV infection in secondary school microsystems in Njombe region, Tanzania.

This study focused on secondary schools students because is more vulnerable to HIV/AIDS risk behaviours such as alcoholism which lead to HIV infection, than any other segments of the population in Njombe region, Tanzania. The main reason was that, secondary school students are in the adolescence stage of human development. During adolescence stage, youthôs behaviour, influenced most by microsystems such as peer groups, leading the individual youth to comply with youthôs moral or immoral risk behaviours. Inculcated by peer groupós pressure (Newman, 2003). As a

result, the secondary school students were vulnerable to engage into HIV risk behaviours.

Therefore, this study was important to generate valid and reliable knowledge that can facilitate to develop primary, secondary and tertiary HIV preventive programmes to rescue the students from HIV infection in secondary schools settings in Njombe region. Also, parents, teachers, counsellors and students will benefit and use findings of this study to conduct community counselling services, leading to proactively prevent HIV infection in schools In particular, the findings of this study may benefit the youth in secondary schools. The youth may learn, adopt preventive behaviours against HIV infection and avoid the danger of HIV infection. .The Bronfenbrennerôs Ecological Systems Theory can guide delivery of the community counselling services in schools, to facilitate adoption of the preventive behaviours.

1.7 Limitations of the Study

Limitations entail barriers that reduced the quality of findings of this study. In this report the limitations was caused by its theoretical framework. .Bronfenbrennerôs Ecological Systems Theory (1988) guided the presentation, interpretation, analysis, discussion and conclusion of the findings of this study. In the context of Bronfenbrennerôs theory this study encountered the following limitations. First, insufficient attention of biological systemôs on contribution to determining human behaviours. Secondly, inadequate attention to cognition process as determinant of human behaviours. Third, insufficient decision and category, if changes of human behaviours are qualitative or quantitative by nature (Berndt, 1997) However, the

Bronfenbrennerôs Ecological systems theory is credited of emphasizing significance of powers of ecological systems which host and determine human behaviours. However, perception variable was added to the study to add the biological factor into the findings of this study. Another limitation is use of condom and reduction of the number of sexual partners. These are HIV preventive behaviours but socially and legally sanctioned to secondary school students.

1.8 Delimitation of the Study

Delimitation refers to boundaries covered by the study. Geographically, this study was restricted to randomly selected secondary schools in Njombe region only. In terms of contents the study analyzed the following variables. Perception variables such as credibility of preventive knowledge, susceptibility to HIV, primacy effects of preventive knowledge and self-efficacy perception variable was examined because it related to brain which directly regulate human behaviour. Also, this study examined ecological variables such as schools, families, peer groups and church or mosque.

Lastly, the study explored exosystems variables such as accessibility to messages from television, radio, internet and print media. These psychosocial variables (independent variables) were predicted and believed by secondary school students to influence the process of adoption of preventive behaviours (dependent variable) against HIV infection among secondary schools students in Njombe region. In the context of Bronfenbrenner Ecological Systems Theory, mesosystems, macrosystem and chronosystems were not examined. The reasons included the following: Microsystems and Chronosystems were representative of other ecological systems.

1.9 Operationalization of key Variables

Credibility, involves believability, trustability caused by possession of valid and reliable knowledge.

Ecology, consist of environmental systems that determine behaviour of living human being through interactions. In the context of this study, ecology entails interactions between perception, microsystem, exosystem variables, secondary schools students and their environments.

Exosystem variable, refer to mass media connected structures such as television, internet, radio and print media that influenced level of adoption of preventive behaviours against HIV infection among students in secondary schoolsô settings in Njombe region, Tanzania. This interpretation was utilized in this thesis report.

Invulnerability means beliefs of not being at high risk to psychological threat. This meaning was used in this study.

Microsystem variable entails social supportive group components such as schools, family, church/mosque, peer group systems and health care systems that influenced adoption of preventive behaviours against HIV infection among students in secondary schoolsô settings in Njombe region. This simplification of the concept was utilized in this thesis report.

Perception variable pertain cognition factors related to credibility of preventive knowledge, susceptibility, primacy effects, self-efficacy, invulnerability and persuasibility that influenced process of adoption of preventive behaviours against HIV infection among students in secondary schoolsô settings in Njombe region. This interpretation was utilized in this report.

Persuasibility, means individualôs belief level to change behaviour as a result of rational arguments**.** This definition was used in this report.

Preventive behaviours, indicates adoption of preventive education against HIV infection, adherence to sexual abstinence, avoid alcoholism behaviour, avoid drug abuse ,adherence to faithful moral behaviours, uptake of VCT services and health care seeking behaviours . This elaboration was used in this report.

Primary prevention intervention services, refers to preventive psychological strategies provided to health clients proactively before the psychological problem occur. This meaning was used in this thesis report.

Secondary prevention intervention services, pertains preventive psychological strategies provided to clients with early symptoms of developing psychological problems. This simplification was used in this thesis report.

Tertiary prevention intervention services: Signify preventive psychological strategies offered to clients who already have been attacked by the psychological challenge to reduce disability. This definition was utilized in this thesis.

Psychosocial determinants refer to psychological perception, microsystems and, exosystem variables that influence adoption of preventive behaviours against HIV infection in schools settings. These includes credibility of preventive knowledge, primacy effects of preventive knowledge, school, family, peer group, faith based organizations and mass media. This definition was utilized in this thesis. The next chapter presents, Literature review.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the theoretical framework, conceptual framework and empirical literature review. The Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1979; 1988) served as the main theory of the present study. It guided the analysis and understanding of the psychosocial determinants on adoption of preventive behaviours against HIV infection among young people in the school settings. The ecological systems theory was opted because it deepened understanding and analysis of HIV related behaviours in social settings.

In addition, the application of the Bronfenbrennerôs Ecological Systems Theory was based on understanding that, psychosocial determinants and behaviours associated with preventive behaviours, were examined and understood well by dialectically analysing individualôs perception, ecological settings and interactions that either lead to practice of risk behaviours or adoption of preventive behaviours against HIV infections in school settings. Utilization of the Bronfenbrennerôs Ecological Systems Theory provided a clear focus in interpretation, discussion and conclusion of the findings in this report.

2.2 The Bronfenbrenner's Ecological Systems Theory

Bronfenbrennerôs Ecological Systems Theory is a social psychological perspective that advocates the powerful influence of environmental determinants of individual humanôs behaviour throughout the life span (Berndt, 1997). The ecology of human development refer to the scientific study of the progressive, mutual accommodation

throughout the life span, between a growing human organism and the changing immediate settings in which the organism is hosted. Thus, in the framework of the theory, in this report, determinants that influenced the adoption of preventive behaviours against HIV infection among secondary school students were examined within the ecological systems that directly or indirectly hosted the individual students in secondary schools.

Bronfenbrenner (1986) argued that, any change, originating inside or outside the individual ecological systems may alter the existing relationship between the person and the environmental setting. This change created dynamic powerful forces that lead to instigate changes of individualôs behaviour. Moreover, changes in one ecological system could alter changes in the previous or next ecological system leading to changes of behaviours of the organism hosted into the changed ecological systems. The theory, further postulated that changes of the organismôs behaviour caused changes of the hosting ecological systems. Bronfenbrenner summarized that, both nature and nurture forces significantly contributed to influence individualsô development and shape behaviour of the individual in the social settings (Berndt, 1997).

In addition, culture of the community is noted as one of the most significant influence of the organismôs behaviour and development (Berndt, 1997; Newman & Newman, 2003). According to Newman *et al.,* (2003) Bronfenbrennerôs Ecological Systems Theory is subdivided by concentric systems which consist of interdependent elements sharing common history, goal, characteristics, interrelated functions, boundaries and identity. The systems change in the direction of adjusting or

incorporating more inputs from the environment in order to survive, prevent disorganization which may result due to environmental fluctuation challenges. Thus, the ecological systems namely microsystems, mesosystems, exosystems, macrosystems and chronosystems constantly change to adapt to the new demands of the changing environment dynamics so as to comply with the ecological systems and there by survive. Santrock (2003) and Newman *et al.,* (2003), describe the five components of Bronfenbrennerôs Ecological Systems Theory. These systems are chronologically arranged from the fine grained inputs of direct interactions with social agents such as adolescents, parents, teachers, clergies, to the broadest based inputs of culture (Bronfenbrenner, 1979; 1986 & 1988; Santrock, 2003 & 2004).

2.3 Functions of the Components of Ecological Systems Theory

2.3.1 Microsystem

The microsystem is the lowest environmental system; this system influences the settings for an individual personôs behaviours, activities, participants and roles within the microsystem (Berndt, 1997; Newman *et al.,* 2003). The specific setting could be a particular geographical or catchment area. On the other hand, participantôs means individuals hosted into the setting while roles signify formal and informal responsibilities.

Moreover, activities indicate functions performed by individuals habited in the setting. Behaviour pertains to voluntary and involuntary actions performed by the individuals hosted into the setting (Berndt, 1997).Thus, microsystem change would depend upon the dynamics and the size of the population of the participants into the settings. The new participants who enter into the setting can automatically alter the

status of behaviours and functions into the microsystem setting. The individualôs behaviour changed automatically just as new participants enter the setting to comply with the environment. Also, the behaviour of the participants into the setting automatically change just when a participant drop out the settings.

The microsystem, allow direct interactions between individuals young people into the system. School as a microsystem allow direct interaction between social agents such as teachers, learners, faith based leaders and parents. As a result, create a particular environmental system and determine level of adoption of preventive behaviours against HIV infection among secondary school students.

Similarly, microsystem host family, school, health care services, peer groups, church/mosque/temple Faith Based Organisations (FBO); and work place (Bronfenbrenner, 1986; Cobb, 2001; Meece, 2002; Santrock, 2003). Microsystem can be important source of support or source of conflict among members of the setting (Bronfenbrenner, 1979; Dalton *et al.,* 2007). Microsystem hosts the individual immediately and longer time. For example, young people spend more time in peer groups because they share similar interests, sensation and perception about various neomena and phenomena (Bronfenbrenner, 1986).

Therefore, in the context of this study, adoption of preventive behaviours against HIV infection among secondary school students was determined by attitudes, beliefs and functions of items of microsystem, mostly hosting the students. The items includes, faith based organisations, schools, families and peer groups. The church or mosques as religious faith microsystem possess divine powers and ecological forces

to influence young people to adopt sexual abstinence preventive behaviours. This behaviour is a strong protection against HIV infection among young people in microsystem such as secondary schools. Also; it is most accepted by Faith Based Organizations.

2.3.2 Mesosystem

The mesosystem denotes the second level of environmental systems. It reflects connections among microsystems components in which the person spends most of the time and experience direct and immediate interactions. Mesosystem, thus, pertains to interactions between families, schools, church/mosque, peer groups, neighbourhood Microsystemsôs components (Berndt, 1997; Bronfenbrenner, 1976, 1977 & 1979; Santrock, 2008).

Moreover, mesosystem such as connection between schools and peer groups may encounter conformity or contradictions between the microsystem components depending upon variations and conformity of consciousness, sensations, perceptions and beliefs of each microsystem component (Santrock, 2003). Peer groups, for example, may contradict with schools, families and faith based organisations because adolescents in peer groups have different consciousness and perceptions as compared to teachers, parents and clergies. Thus, in the context of the Ecological Systems Theory (Bronfenbrenner, 1986), it was important to examine and understand components of the microsystem and mesosystems (Santrock, 2008).

In addition, individuals such as adolescents spend most of their time in varieties of mesosystem environmental systems such as schools, families and peer groups.

However, some environmental systems such as peer groups can positively or negatively influence the behaviour of individuals such as adolescents (Berndt, 1997). Preventive behaviours and intervention preventive measure ought to involve multiple environment systems in the context of mesosystem leading to effectively combat HIV infection among secondary school students in Njombe region, Tanzania.

Mesosystem, influence the individual person within each microsystem component. Ecologically, the individual influence each level of systems in which the person was hosted. A dialectical and interdependence relationship between individuals and layers of environmental systems involves interdependence existing between items of microsystem such as school, families, church/mosque/ temple, peer groups and work place. Any change of functions and behaviour of any item of mesosystem would impact consequential changes to another component of the mesosystem.

2.3.3 Exosystem

The exosystem indicates third level of environmental systems. This system indirectly influences the individual who is hosted at microsystems (Berndt, 1997; Bronfenbrenner & Morris, 1998). Exosystem variable that influence individual person at microsystem level such as schools and families includes programs of television, radio, internet, news papers, news letters, brochures, mobile phones and cinema tapes (Berndt, 1997; Newman *et al.,* 2003). While only a few persons directly contribute to compose the message contents of mass media programs, most of persons, particularly, young people are influenced by the mass mediaôs programs they watch, hear and read from far varied sources. Both desirable and undesirable information from far away are transmitted to the audiences such as adolescents in

schools, homes, peer groups, health care systems and work places (Newman *et al.,* 2003; santrock, 2003). Most of the times, such mediaôs information are not compatible with Tanzaniaôs culture.

In addition, work place is another exosystemôs variable that indirectly influence status of environmental systems at lower levels such as microsystems and mesosystems. Work influence workerôs emotions, attitudes, positive and negative reinforcements, income level, sensations and perceptions. Also, changes of work conditions in relation to duration of working time, promotion, demotion, travelling and work load.

Thus, changes of any of exosystem variables in relation to the parentsô work indirectly change positively or negatively, the relationship status between parents and dependants at families, schools and peer group systems (Cobb, 2001; Dacey & Travers, 2004; Santrock, 2003). At the moment, most parents are too busy with official works and use more time performing formal duties. As a result their children are left with minimal guidance and counselling leading them to engage into deviant behaviours. Also, the stress caused by too much work at office, can be transferred by parents into the family life, leading to unstable family life particularly adolescentsô life (Cobb, 2001).

2.3.4 Macrosystem

The macrosystem is the fourth broad and global level of environmental systems; it determines the behaviour of the lower level systems across the society. Macrosystem comprised of culture, ideology, values, religious beliefs, philosophy and policies.

These components guide the entire functions of the society (Berndt, 1997; Bronfenbrenner, 1979). Culture is transmitted through socialization performed by the microsystems such as schools, families and faith based organisations, from older generation to a new generation. Culture, guide behaviours, functions and beliefs of microsystems, mesosystems, exosystems and chronosystems (Berndit, 1997; Newman, *et al.,* 2003). Macrosystem involves International conversions and declarations, Governmentôs decisions, legislations and court decisions (Dalton, *et al.,* 2007).

2.3.5 Chronosystem

The Chronosystem forms firth level of environmental systems. It consists of personôs transitions and sociohistorical conditions across the life span of the individual depending upon time progress (Berndt, 1997; Bronfenbrenner, 1979; Santrock, 2004). Again, chronosystem denotes patterns of stability and changes of individualôs environmental systems depending upon time progress. Individualôs historical background of education, health, parenthood and occupation, can determine his/her behaviour in a particular level of the environmental system. The adolescents can change education level by moving from primary education to secondary education.

These changes of education level alter the behaviour of the adolescents due to changes of education level and environmental system from primary to secondary school microsystem. As a result, the individualôs behaviour can change into good or deviant behaviours depending upon the functions of the microsystem. It is obvious that historical changes of ecological systems hosting the organism can alter the status of behaviour of the organism especially young people in secondary schools settings

(Berndt, 1997; Cobb, 2001; Dalton *et al.,* 2007; Newman *et al.,* 2003).

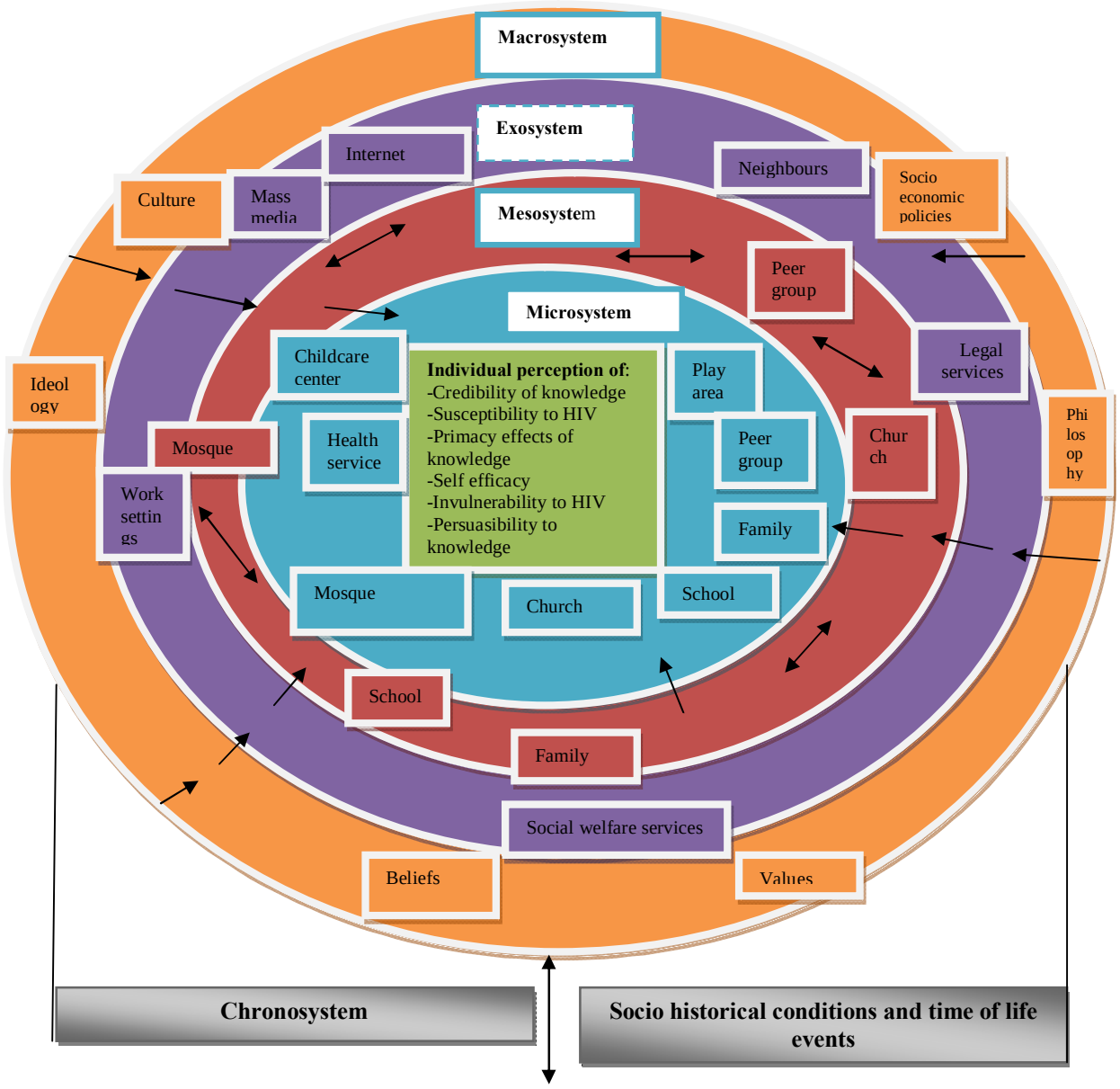

Figure 2.1: Bronfenbrenner's Ecological Systems Theory
Source: Santrock, 2004, p.69

Key. ⟶ Unidirectional influence.
⟷ Bidirectional influence.

In the frame work of the present study, chronosystems were predicted to influence individualôs level of education leading to adopt or not adopt preventive behaviours such as use of VCT services against HIV infection among secondary school student. However, the macrosystem, mesosystem and chronosystem were non-study

variables, but they might have influenced studentsô adoption of preventive behaviours against HIV infection. Figure 2.1 presents theoretical framework according to Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988).

2.4 Delineation of Study Variables / conceptual Framework

Psychosocial determinants signify factors that influence interactions among psychological, social and ecological variables. Also, psychosocial determinants explain the socialization process in the microsystems components as elaborated in theô Bronfenbrennerôs ecological systemôs theory (Newman *et al.,* 2003). Such microsystems settings include schools, families, church /mosque/temple and peer groups. Also, exosystems settings such as mass media. In this study, psychosocial determinants were categorized into three independent clusters of variables, namely: perception, microsystem and exosystem variables. Each independent variableôs cluster contained inputs which through moderating variables determined the dependent variable, that is, the level of adoption of preventive behaviours against HIV infection among secondary school students (see Figure 2.2).

2.4.1 Perception Variable

In the present study, perception variable cluster included: Perceived credibility of preventive knowledge, believability and trustworthiness of preventive information, knowledgeability and expertise of the communicator. Also, other predictive perception variables were susceptibility to HIV, primacy effects that is promptness of delivery of preventive knowledge to the receiver, self-efficacy, reliability and validity of preventive information. These inputs of the perception independent variables were hypothesized and moderated by the socio demographic variables such

as gender. The perceptionôs input variables were predicted to influence the process of adoption of preventive behaviours against HIV infection among secondary school students (Franzoi, 2000; Horowitz *et al.,* 1995).

Similarly, the predictive influence of the independent variables on the dependent variables was well explained in the respective section of literature review. The way such independent variables and dependent variables were measured was elaborated in the methodology section of this report. Their level of influence was largely shown in the findingsô section of the present study.

2.4.2 Microsystem Variable

This cluster of variable comprised of schools, families, and peer groups, religious institutions such as church / mosque and temple as well as health care systems. All these credible social institutions provide supportive socialization in the communities. These microsystem components were predicted to significantly influence the dependent variable that is level of adoption of preventive behaviours against HIV infection in school settings in Njombe region. The inputs of microsystem variables were moderated by the socio-demographic variables such as gender, education level and religiosity. The predictive functions, roles, associations and influence of microsystems as independent variable on their dependent variable was correctly explained into their respective section of literature review in the present report.

The measurement issues such as the way they were measured to determine association and influence of microsystems were elaborated into the methodology chapter of this report. Matters related to Microsystemsôs findings of the present study

form the core function of the results and discussion chapters of this report (see Figure 2.2).

2.4.3 Exosystem Variable

By and large, exosystem variable reflect the roles, functions and behaviours of the social mass media influencing human actions, feelings, mental process and behaviour. In this study, the input components of exosystems as predictor independent variable included: Accessibility to televisionôs message, internetôs messages, radioôs messages, print mediaôs message and compliancebility to policy on preventive behaviours against HIV infections in schools. These inputs of the independent variables were moderated by the clientôs socio- demographic variables such as language used in communication of message, proximity to mass media and education level of the client (See Figure 2.2).

Similarly, the predictive functions, roles and practical influence of the exosystems input variables were well elaborated in literature review section of this report. The measurement of the independent variables and dependent variable in relation to exosystems variables were elaborated and presented in the methodology chapter in this report. The level of exosystemsô influence and association between independent variable and dependent variable were well elaborated and presented into the findings and discussion chapters of the present report.

Lastly, perception, microsystem and exosystems independent variables interact and jointly influenced by the moderating variables such as clientôs level of education, age, gender and religiosity beliefs. As a result, the perception and ecological systems

determined the dependent variable that is adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Figure 2.2 presents a conceptual framework.

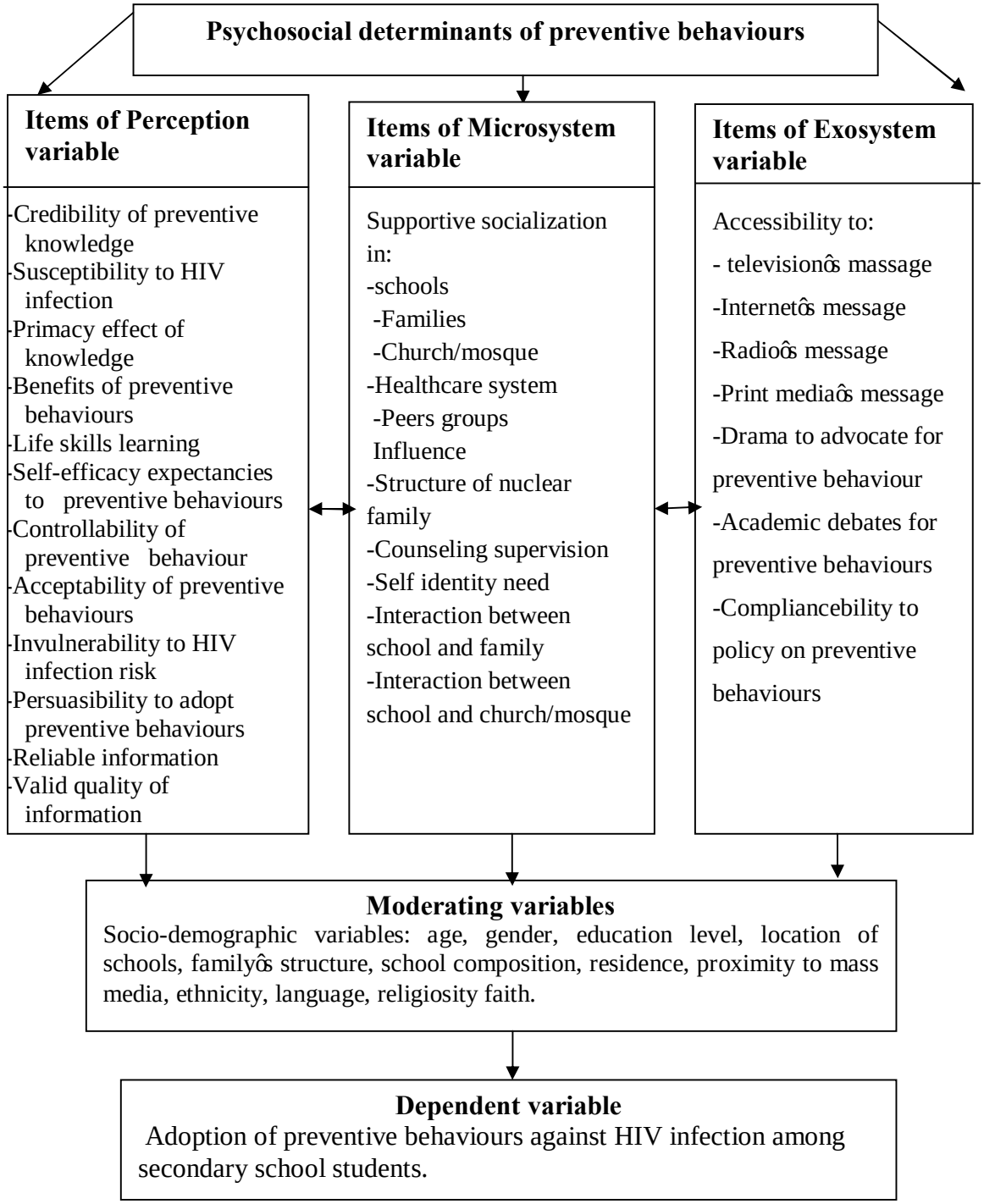

Figure 2.2: Modified Conceptual Framework Integrating Bronfenbrenner's Ecological Systems Theory with Psychosocial Determinants on Adoption of Preventive Behaviours

2.5 Empirical Literature Review

This section presents findings reported by previous studies on HIV prevention efforts to protect youth in and outside of schools settings. The results were arranged according to specific research objectives, that is perception variables, microsystems variables and exosystem variables.

2.5.1 Perception Variable

Perceived credibility of preventive knowledge entails believability of the communicator, counsellor such as the teacher. Characteristically, credibility is made of expertise, trustworthiness, familiarity, similarity, likability and perceived intention of the communicator to help the clients (Horowitz *et al.,* 1995). Other documents reported significance of credibility of communicator and message to facilitate communication includes (Franzoi, 2000; Myers, 2008; Widman, Noar, Choukas-Bradley & Francis, 2014). Credibility of sources of preventive education against HIV infection has been shown to influence the process of adoption of preventive behaviours against HIV infection among students in secondary schools (Bankole & Mabekoje, 2008; Ojieabu, Erah & Okafor, 2008).

In addition, susceptibility to HIV infection is another significant perception factor that has been reported to influence adoption of preventive behaviour against HIV infection among youth in and out of schools. Studies conducted in Kenya and Uganda (Mwamwenda, 2013) among high secondary schools students found that, studentsô awareness of their susceptibility to HIV infection influenced the process of adoption of preventive behaviours in schools. Other studies that reported contribution of perceived susceptibility to HIV infection to cause increased uptake of

VCT services included the following (Agha, 2003; Gatta & Thupayagale-Tshweneage, 2012; Kibombo, Neema & Ahmed, 2007; Tarkang, 2014a; Underwood, Hachonda, Serlemitos & Bharat-Kumar, 2006; Wolfgang & John , 1996). As a result, some of the students in secondary schools in Uganda, Addis Ababa and Cameroon were compelled to adhere to HIV preventive behaviours including sexual abstinence due to perceived susceptibility to HIV infection.

Perceived clientôs invulnerability imply personôs belief that an individual is not at risk of psychological threat such as alcoholism behaviour that lead to HIV infection (Myers, 2008). As a result, the individual perceived little need to adopt preventive behaviours such as use of condom against HIV infection during sexual activity among students. In northern Uganda 66% (N=1312) of students perceived not to be at risk to HIV infection (Dente *et al.,* 2005). Also, Glick (2005) reported that studies done in Uganda and Zambia indicated that, respondents who perceived as being invulnerable to HIV infection were not motivated to attend VCT services.

A study conducted in Tanzania by Urasa, Moshiro, Chalamila, and Mhalu & Sandstron, (2008) reported that in Dar es Salaam, male youth resisted to adopt preventive behaviours because they perceived themselves were not at risk compared to female youth who complied with preventive behaviours because they believed to be at risk to HIV infection. Other studies that reported contribution of invulnerability perception to HIV infection, to low uptake of preventive behaviours against HIV infection among secondary school students included (Asekun-Olarimoye *et al.,* 2011; Jemmott, 2010; Kabiru & Orpinas, 2009; Mlingo, 2008; Okwun, Silaj & Okwun, 2012). Consequently, some studentôs hesitated to adopt preventive

behaviours against HIV infection in Zimbabwe, Kenya and Malaysia due to invulnerability perception.

Furthermore, other studies reported the role of invulnerability perception to determine process of adoption of preventive behaviours against HIV infection in schools included (Haddison *et al.,* 2012; Madiba & Mokgatle, 2015; Sisay, Erku, Medhin & Woldeyohannes, 2014). These studies were conducted and reported their findings in Nigeria, Ethiopia and South Africa. The findings complied with results reported in Tanzania (Philemon & Kessy, 2008). The young people in Tanzania reported invulnerability perception to HIV infection in various settings including schools. As a result, some youth persistently practiced HIV risk behaviours such as alcoholism, drug abuse and multiple sexual partners leading to risk of HIV infection. However, the reviewed studies insufficiently reported about perception related determinants on adoption of preventive behaviours against HIV infection in schoolsô microsystems.

2.5.2 Microsystem Variable

Social supportive socialization in the school systems was reported to influence the adoption of preventive behaviours against HIV infection. The school as a credible microsystem, endowed with good functions, such as confidentiality, safety, authentic rules, supportive settings, values, conformity, valid, reliable communication systems and commanding powers that can influence studentôs actions and behaviours. These qualities enable the schools to enhance youthôs adoption of preventive behaviours against HIV infection. Research findings have indicated that use of drama in schools improves the delivery of HIV prevention knowledge and attitude changes among

high secondary school students in South Africa (Harvey, Stuart & Swan, 2000).

Moreover, Gallant *et al.,* (2005) found increased knowledge about HIV preventive behaviours among youth in schools. Consequently students practiced delayed sexual debut and reduced the number of sexual partners. While changes in knowledge and attitudes appeared easier to acquire, but behaviour changes remained difficult among secondary school students. Study conducted among secondary school students in Uganda (Dente *et al.,* 2005) revealed that, students had adequate knowledge about preventive behaviours. To this status, sexual abstinence and condom use were the most reported HIV preventive behaviours, suggesting the strong influence of school socialization process.

Thus, these findings suggested powers of a school as an ecological microsystem. On the contrary**,** studies conducted in Tanzania revealed high preventive knowledge among students but reported low levels in the adoption of preventive behaviours such as use of VCT services against HIV infection in secondary schools (Kalolo & Kibusi, 2015; Kamala *et al.,* 2006). Also, a study conducted by (Cheng *et al.,* 2008) in rural area in China suggested that preventive education programme in schools boosted protection self-efficacy, enhanced effective communication between students, teachers and peers on HIV prevention practices. In South Africa research findings (Jukes, Simmons & Bundy, 2008) reported that, expansion of primary and secondary school education for girls enhanced to reduce vulnerability to HIV infection among female students. Preventive education programmes were reported to encourage students for uptake of VCT services which was important strategy for prevention of HIV infection among secondary school students.

Similarly, Nwaorgu, *et al.,* (2009) found out that, leaders and community members accepted family life and HIV preventive education to be delivered into their schools in Enugu state, Nigeria. A study conducted by (Aletha *et al.,* 2010) found out that, schools were recommended to provide preventive education against HIV infection because schools host adolescents most time, has skills to inculcate preventive behaviours against HIV infection into leanerôs mind, have strong philosophical and psychological power to influence students to adopt preventive behaviours against HIV infection.

Moreover, various studies in Tanzania and other places of the world, have reported that, lower rates of risk sexual practices were associated with accessibility to schools. Also, studies reported schools to be one of the important sources of credible preventive education against HIV infection among secondary school students (Nubed & Akoachere, 2016; Yahaya, Jimoh & Baligun, 2010). Other studies that reported significant contribution of schools to deliver HIV preventive knowledge leading to determine youthôs process of adoption of preventive behaviours against HIV infection in schools included (Enahoro *et al.,* 2015; Kabate, 2007; URT, 2000, 2001, 2002 & 2004; WHO, 1989).

However, UNESCO (2001), found that, there was insufficient cooperation between schools, families, church/mosque/temple and traditional healers as socialization microsystems. As a result, most young students had high level of awareness of HIV prevention knowledge but little adoption of preventive behaviours against HIV infection among youth in school settings. Thus, the mismatch between level of HIV prevention knowledge and low process of adoption of preventive behaviours caused

challenges that justified conducting the present study.

Likewise, other studies that reported the socialization power of schools to influence students to adopt preventive behaviours against HIV infection in schoolsô settings included (Aylikci, Bamise, Hamidi, Turkal &Colak, 2013; JemmotIII *et al.,* 2010; Kimani, Kara & Nyala, 2012; Lawrence,Struthers & Hove,2015; Llyod *et al.,* 2012; Madiba & Mokgatle,2015; Michelsen, 2012a; Oladepo &Fayemi, 2011; Rijsdijk, *et al.,* 2012*;* Sukari*,* 2008; Tosk *et al.,* 2016).

Similarly, a study conducted in Addis Ababa, Ethiopia, reported that, 75.7% of the high secondary school students had enough preventive knowledge about VCT services. However, only 32% respondents rated themselves as being at risk of HIV infection and only 62.2% of high secondary school students used the VCT services and suggested that VCT services should be established in every secondary school in Ethiopia for better access to VCT services among high secondary school students. Such studies Cleary show that studentôs invulnerability perception determined level of utilization of VCT services among secondary school students in Ethiopia (Gatta & Thupayale-Tshweneagae, 2012).

A study conducted in Tiko health district, in Cameroon among high secondary school students reported that, only 73.8% (n=350) had knowledge about VCT services. However, only 27.8% (n=136) students had ever used VCT services. These levels of use of VCT services were very low compared to their high level of awareness about services of VCT. The study reported that, in Tiko health District, Cameroon, among high secondary school students use of VCT services was

positively associated with clientôs age (*p,* < 0.001), sex *(p,* <0.001), school (*p*, <0.001), sexual activity (*p*, < 0.001), attitudes towards VCT (*p,* < 0.001) and knowledge of VCT (*p*, < 0.001) (Haddison *et al.,* 2012). Knowledge about VCT services among high secondary school students in Cameroon was reported to be high although the use of VCT services was very low. The negative association between having high level of preventive knowledge about preventive behaviours such as VCT versus low utilization of VCT among youth especially secondary school students, amplified the question, what are the psychosocial determinants that influenced the level of adoption of preventive behaviours such as use of VCT, among students?

Moreover, schools as socialization microsystem have been documented in various studies as powerful social institutions influenced most young people to increase level of adoption of preventive behaviours such as adherence to sexual abstinence and avoiding alcoholism (Mbatia & Sangiwa, 1996). As a result, the students in schools avoid HIV infection. Other studies that reported findings on socialization powers of schools included (Atwood, Kennedy, Schamblem,Tegli & Garber *et al.,* 2012; Fonner, Amstrong, Kennedy, OôReilly & sweat, 2014; Giddens, Duneir, Applebaum & Deborah, 2012; Kendall, 2008; Lata & Sigh, 2015; Lee, 2013; Nketiah-Amponsah *et al.,* 2013; Omage, 2013; Schaefer, 2011; Thanavah, Rashid, Kasuya & Sakamoto, 2013).

However, the reviewed previous studies insufficiently reported the real socialization powers of the school in the context of ecological systems and interactions with other ecological levels at a mesosystems level. This challenge justified to conduct this study. Thus, this study examined ecological powers of the schools in relation to

determine process of adoption of preventive behaviours against HIV infection among secondary school students in school ecological settings.

Similarly, social supportive socialization in family systems influences the adoption of preventive behaviours such as avoiding alcoholism against HIV infection to students in schools. Family was a powerful social institution at microsystems level (Lewis *et al.,* 2003). Moreover, UNESCO (2001) found out that in African continent family structures determined process of adoption of preventive behaviours against HIV infection. Traditionally the extended family in African societies including Tanzania was a substitute of nuclear family. However, at present both nuclear family and extended families have been weakened due to death of parents caused by HIV/AIDS. Therefore, the unstable nuclear families fail to correctly socialize influence the studentôs adoption of preventive behaviours against HIV infection among secondary school students in African countries including Tanzania.

A study conducted by Bankole & Mabekoje (2008) reported that, in Ogun state ï Nigeria, families were appropriate channels for delivering preventive knowledge against HIV infection to students at the rate of 74%, in Nigeria. Also, families provided socialization, host the student and provide basic human needs such as food, water, shelter, informal education, values, norms and beliefs as reported by Ekuri *et al.,* (2009). However, some studies reported that, parents feel uncomfortable to communicate directly reproductive health information and preventive behaviours with their secondary school female students in the family context. These findings complied with those reported in South Africa and Tanzania by Namisi *et al.,* (2009). Also, findings from South Africa and Tanzania indicated that, female adolescents

preferred to receive reproductive health information from their mothers while male adolescentôs preferred to receive such information from their fathers.

Moreover, other studies that report families power as socialization microsystem and had social powers to influence adoption of preventive behaviours against HIV infection among youth included (Adu- Mireku, 2003; Bastien, Kajula & Muhwezi, 2011; Denson, McCauley, Dunnett-Daggy, Lung & Sweat, 2008; EMAU, 1995; Lofgren, Byamugisha, Tillgren & Rubenson, 2009; Mlunde *et al.,*2012; Miller, Kotchick, Dorsey, Forehand & Ham, 1998; Miller *et al.,* 2011; Macionis,1999; Muhwezi *et al.,* 2015; Oladepo *et al.,* 2011; Omage, 2013; Robertson, 1988).

In addition, families have been reported to influence youthôs behaviours at mesosystem levels into the ecological systems. The families interact with schools, faith based organizations and peer groups (Adeboye, *et al.,* 2016; Musiimenta, 2012; Onifade & Dele-Osibanjo, 2013; Rosengard *et al.,* 2012; Studsrod & Bru, 2009; Tarkang, 2014b). Thus, families are powerful social agents that can influence youthôs behaviours including adoption of preventive behaviours such as use of VCT services against HIV infection among secondary schools students in schoolsô environment.

In Tanzania, a study conducted by Masanja and Msuya (2014) found out that, in school and out of school youth ranked their parents and religious leaders as the most important source of information on reproductive health delivered to prevent HIV infection to students in secondary schools. Sexual abstinence was the most popular preventive behaviour among youth in Maswa District Council in Tanzania. These

findings were influenced by African traditions which allowed communication of reproductive health information among individuals of similar sex.

Likewise, in Tanzania Kitula & Ndaluka, (2014) found out that, traditional taboo prohibited parents in families, not to communicate directly reproductive health and preventive behaviours matters to their youth in schools and out of schools in Muleba, Ludewa and Handeni Districts. Communication of reproductive health and preventive behaviours was allowed through traditional initiation rites, sages and extended family members such as uncles, for male youth and aunts for female youth (Ntukula, 1994). These findings complied with those reported in Zambia that local norms (taboo) restricted parents from communicating directly with their adolescents about reproductive health matters.

Traditional taboo prevailed in most African societies including Tanzania (Mburu *et al.,* 2014). However, the reviewed previous studies insufficiently reported families as significant social determinants of preventive behaviours against HIV infection in secondary schools ecological system. Thus, the insufficient reporting of the families roles to adoption of preventive behaviour against HIV infection in schools, justified the need to conduct this study. Additionally, social supportive socialization in faith based institutions, influenced adoption of preventive behaviours against HIV infection among secondary school students. The church/mosque or temples are empowered with divine powers, empathy, sympathy, confidentiality and spiritual counselling. Also, clergies prevent youth not to engage into immoral sexuality. UNESCO (2001) reported that, the church/mosque control religious beliefs, ethical

values, norms and morality behaviours.

The preventive behaviours against HIV infection relate to ethical values guided by the Faith Based Organisation (FBO). Thus, Faith Based Organisation such as church, mosque or temple determined level of adoption or non adoption of preventive behaviours against HIV infection in secondary schools. Experience from Uganda, Thailand and Zimbabwe (UNESCO, 2001) indicated that church/mosque inculcated into students beliefs and trust on sexual abstinence which was the most accurate preventive behaviour against HIV infections among all people. Faith leaders are much credible, trusted and respected by their believers including secondary school students. Faith leaders cooperated with schools, families and health centres at mesosystem level in instilling into youthôs mind adoption of preventive behaviours such as avoiding alcoholism and unethical behaviour against HIV infection among students in secondary schools.

Similarly, a study conducted by Aletha *et al.,* (2010) reported that, Faith based organizations are strong enough to enhance adoption of preventive behaviours against HIV infection among secondary school students. These organizations prevented youth to participate in risk behaviours such as alcoholism, drug abuse, homosexuality and bio sexuality. A study conducted by Majeed and Seddigheh (2010), reported that loyality to Islamic religious beliefs was a significant determinant factor to adoption of preventive behaviours against HIV infection to students. Islamic beliefs instructed their youth to adopt sexual abstinence as correct protective behaviour against HIV infection in Iran as it was accepted and approved by the Islamic religious belief.

Furthermore, Noden, et al., (2010) reported that, religious affiliation contributed to increased understanding of preventive knowledge about HIV transmission and prevention among unmarried youth in rural central Mozambique. Also, religious affiliated youth knew most preventive behaviours against HIV infection than non-religious youth. Again religious affiliated youth knew most routes of HIV transmissions than non religious youth. However, findings indicated that both religious affiliated and non religious youth insufficiently adhered to adoption of preventive behaviours against HIV infection among youth in and out of school in rural central Mozambique. These research findings indicated that, religiosity was a significant determinant factor that mediated adoption of preventive behaviours against HIV infection among students but it needed to be subjected to further scientific research.

In addition, a study conducted by Oladepo *et al.,* (2011), reported that in Western Nigerian city, religious inclination determined adoption of sexual abstinence among secondary school students at a rate of 13.6% (N=370). This finding indicated the power of religious institutions as socialization agents such that it could shape the behaviour of youth in and out of secondary schools leading to adopt preventive behaviours against HIV infection. According to (Musiimenta, 2012) in Uganda, FBO such as church, mosque and temple emphasized moral based preventive behaviours against HIV infection in secondary schools such as adherence to sexual abstinence.

These behaviours enhanced to attain spiritual uprightness and youthôs acceptability by the church, mosque, temple, family and school microsystems. Also, Tarkang (2014b) reported that, in Cameroon, Roman Catholic Church and Protestant church

prohibited the female secondary school students to use contraceptives including condoms, because such actions was perceived as transgression of divine law and a sin against the Christian moral beliefs. Instead, the church insisted their youth to adhere to sexual abstinence and encouraged to serological testing before marriage. Also, the Christian youth were requested to avoid alcoholism and drug abuse practices. These behaviours were perceived as reliable and valid preventive behaviours against HIV infection among youth in and outside schools.

Moreover, according to U.S Presidentôs Emergency Plan for AIDS Reliefs (PEPFAR) (2012), FBO use religious theology, language and philosophy to communicate HIV preventive education to students in secondary schools. As a result, students in secondary schools adhered to preventive behaviours against HIV infection in secondary school settings. These findings complied with those reported by (Shaw & Bassel, 2014) that, increased religiosity was associated with lower level of engaging into HIV risk sexual behaviours. Hence, religiosity level was a determinant variable for adoption of preventive behaviours against HIV infection among youth in and out of secondary schools in Columbia.

In addition, other studies that reported social powers of the faith based organisations, as socialization microsystems, that could influence adoption of preventive behaviours against HIV infection among youth in schools included (Agadjanian, 2005; Amoako- Agyeman, 2012: Bankole *et al.,* 2008; Chacha & Bower, 2005; Mantelly, Correale, Adams,ï Skinner & Stein, 2011; Mpofu, Nkomazana, Muchado, Togarasei & Bingenheimer, 2014; Moore & Bruder, 2005; Noden*, et al.,* 2010; Sukari, 2008; Tenibiaje, 2010).

Similarly, in Tanzania a study conducted by Kitula & Ndaluka, (2014) found out that, church and mosque prohibited the youth to use condom as a means for HIV prevention in Muleba, Ludewa and Handeni Districts, Tanzania. Instead, the church/ mosque instructed their youth to practice sexual abstinence and faithfullfulness according to religious morals. Thus, this findings indicated that, faith based organization are strong determinants of adoption of preventive behaviours against HIV infection among youth in and outside schools in the context of Bronfenbrenner ecological systems theory. Therefore, in the framework of FBO (church/mosque) microsystems level influenced the beliefs of teachers/ counsellors and clients leading to adoption or rejection of preventive behaviours against HIV infection among students depending upon their spiritual beliefs.

Peer group, is a social institution which influence its members such that they can adopt or not adopt preventive behaviours against HIV infection among students in schools. A peer group exert pressure and influence studentsô attitude, interest, language and sources of message on preventive behaviours against HIV infection as reported by (Egbochuku & Ekanem, 2008; Philemon *et al.,* 2008). Also, a study conducted by Egbochuku *et al.,* (2008) in Nigeria in secondary schools reported that, peer group pressure influenced adolescentsô attitudes towards sexual practices by 61.2%. These findings indicated social psychological powers of peer groups as influencing microsystem agent and could determine youthôs behaviours. As a result peer group pressure influenced level of adoption of preventive behaviours against HIV infection in secondary schools in Nigeria.

Also, 56.2% (n= 41) female students and 14.8% (n=12) male In addition, a study conducted by (Maluwa-Banda, 2000), reported that 42.8% (N=599) secondary schools students in Malawi, engaged into risk sexual behaviours due to peer group influence. Also, Cai *et al.,* (2008) found out that, peer education on HIV/AIDS prevention among high school students in Shaghai, China was effective and positive in promoting adoption on preventive knowledge, changes of attitudes and behaviour against HIV infection in schools in Shaghai. Again, Abu-Saeed & Abu-Saeed (2013) found out that, peer education intervention programmes positively and significantly changed attitudes of youth in favour of adoption of preventive behaviours against HIV infection.

Consequently, it reduced incidences and prevalenceôs of HIV infection among youth in schools in north central Nigeria. These findings complied with those reported by Visser (2007) that, peer education contributed to delayed sexual debut practices among adolescents in secondary schools. Thus, peer education significantly contributed to prevention of HIV/AIDS among adolescents students in secondary schools. As a result peer education contributed to adoption of preventive behaviours such as sexual abstinence against HIV infection in secondary schools.

A study conducted by Ragsdale, *et al.,* (2014) found that, efforts to support positive sexual decision-making among non-sexually active adolescents should target peer groups because are effective socialization and determinant agents and can shape behaviour of peer group members. These findings complied with results reported by (Wang, *et al.,* 2014a; 2014b). The findings suggested that, prevention services have to be delivered as early as possible during childhood before individuals reach

psychological challenging adolescentsô stage. Research findings indicated that peer group was the main cause that influence senior secondary school students into risk sexual practice by 38.5% (n=454) in Ojo military barracks in Lagos, Nigeria.

Students were forced into risk sexual practices by peers among secondary school students in Ojo military barracks in Lagos, Nigeria (Chimah, Nnebue, Ilika & Lawoyin, 2015). In addition, another study conducted by Wang, *et al.,* (2014a, 2014b), reported that, peer groups influenced behaviour of their members leading them to engage into risk sexual behaviours. These findings indicated powers of peer groups to determine behaviour of youth such that they could adopt or reject preventive behaviours against HIV infection among youth in schools.

In addition, other studies that reported peer groups as significant determinants for adoption of preventive behaviours against HIV infection in schools included (Akpama,Ayang & Denga, 2012; Al-Lryani *et al.,* 2011; Bingenheimer, Asante & Ahiadeke, 2015; Denison *et al.,* 2008; Fearon, Wiggins, Pettifor & Hargreaves, 2015: Feleko, Koye, Demssie & Mangesha, 2013; Ghojavand, Einal & Ghaeliniya, 2013; Gordon & Mwale, 2006; Maticka-Tyndale & Barnett,2010; Medley *et al.,* 2009; Menna, Ali & Worku, 2015; Michielsen *et al.,* 2012b; Tolli, 2012).

In Tanzania, Mvungi (2004) found that youth preferred peer educators to be source of preventive information against HIV infection at a rate of 42% (N=195. Also, Lema, Katapa & Musa (2008) found out that, peer group influenced most of the youth to get preventive knowledge about VCT by 74.8% (n=322). However, only a small proportion (28.9%) (n= 322) respondents had attended VCT services and

tested to check HIV infection status. These findings indicated that peer groups influenced few youth to adopt preventive behaviours and some youth failed to adopt preventive behaviours against HIV infection among youth in and out of schools in Kibaha District, in Tanzania. Again, in Tanzania, Maro, Roberts & Sovensen (2009) reported that, use of sportôs peer coachers to disseminate HIV preventive knowledge to youth was most effective method in Tanzania.

Similarly, the reviewed previous studies insufficiently investigated and reported ecological systems variables, such as microsystem and exosystem, if they influenced youthôs adoption of preventive behaviours against HIV infection in secondary schools settings. Therefore, in the framework of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1979; 1988), this study examined and reported the psychosocial determinants particularly perception, microsystem and exosystem variables, influenced process of adoption of preventive behaviours against HIV infection in secondary school settings.

2.5.3 Exosystem Variable

Accessibility to televisionôs information determines students understanding and decisions on adoption of preventive behaviours against HIV infection in schools. Television is a powerful persuasion, counselling and advocacy tool as its message spread quickly, possess actuality images, moderate humour, arousal, vividness, concreteness, logical arguments, moderate emotional arguments, attractive colours and sounds. Also, television is the powerful communication organization which can transfer sounds and pictures widely, quickly and large amount. The information transmitted influenced individualôs emotional feelings, taste, interest, perception,

attitudes and consciousness leading to change behaviour and mental process of the individual. As a result, television can determine level of adoption of preventive behaviours against HIV infection among individuals including secondary school students.

A research conducted by Betrand & Anhang (2006) suggested that, mass media systems such as television and radio have strongest impact in influencing behaviour among young people. Televisions are the strongest media program that influenced behaviour of young people in relation to adoption of preventive behaviour against HIV infection in secondary schools in developing countries including Tanzania. These findings indicated that, to be effective, television and radio electronic media ought to combine efforts in persuasion of youth such that they can comply to adopt preventive behaviours against HIV infection in secondary schools in developing countries, including Tanzania.

A study conducted by Bankole *et al.,* (2008) reported that in Ogun state Nigeria, 81.3% (n=418) secondary school teachers received HIV information from television. Also, teachers recommended television to be the most appropriate channel for communicating HIV preventive message to students in schools at the rate of 52%. In addition, a study conducted by Bleakley, Hennessy, Fishbein & Jordan (2008 ;2009), reported that, adolescents exposed to media with sexual content were noted to spend longer duration on watching television programs. This finding indicated powers of television in determining adolescentsô behaviours. Therefore, televisions determined level of adoption of preventive behaviours against HIV infection among adolescents in secondary schools.

A study conducted by Mlingo (2008) suggested that, empirical findings on sources of preventive education against HIV infection among learners in Zimbabwe were chronologically reported to include the following sources: School, 92% (n=69); television, 60% (n=45); newspapers, 9.3% (n=10) and communityôs HIV preventive programmes 4% (n=3). These findings indicated that, mass media such as television, radio and newspapers contributed most preventive information than other sources. Therefore, these findings indicated that mass media has bigger force that determined level of adoption of preventive behaviours against HIV infections among students in secondary schools in Zimbabwe.

A study conducted by Ojieabu, *et al.(* 2008) in Benin City, Africa, reported secondary school studentsô preferences of sources of HIV/AIDS prevention education, as follows: First, television by 34.5 % (n= 655) for male respondents; 36.5 % (n=699) for female respondents. Secondly, radio by 13.0% (n=249) for male respondents; 13.7 % (n=263) for female respondents. Third, public lectures on HIV/AIDS by 10.6 % (n=203) for male respondents and 12.2 % (n=234) for female respondents. Lastly, teachers scored 7.0% (n= 134) of males and 11.0% (n=211) of female respondents. These findings indicated power of television in relation to attraction of secondary school students as source of preventive education against HIV infection in secondary schools.

Majeed *et al.,* (2010) reported that there was significant relationship between accessibility to televisionôs message and tendency to adopt safety behaviours against HIV infection among students in secondary schools in Shiraz City in Iran. Also, Asekun- Olarinmoye, Olajide & Asekun-Olarinmoye (2011) reported that in South

Western Nigeria, 92% (N=450) students received knowledge about HIV prevention through electronic media such as television.

Furthermore, another study conducted on effects of mass media messages on parent-child sexual communication. This study reported that children exposed to the media messages communicated sexual content messages with their parents, than those not exposed to such media messages. These findings indicated the power of mass media as determinant agent that influenced children to adopt preventive behaviours against HIV infection in families and other microsystems such as secondary schools (Evans, Davis, 2012). This finding complied to those reported by other studies that young people seeked additional reproductive health information from other sources such as mass media specifically television and internet (Rosengard *et al.,* 2012).

A study conducted by (Omage, 2013) reported that in Benin City, Nigeria, mass media was the first and main source of HIV prevention information to secondary school students at the rate of 37.5% (N=120). Research findings on sources of informationôs and knowledge about HIV/AIDS among higher secondary school students in Ghana, suggested the following sources: Mass media, 44.5%; school, 25%; Health workers, 15.5% and community members 15% (N=200). This finding complied with those reported by other research findings that internet was one of the mass media reported to be most important source of information about HIV/AIDS among high school students in Kirikkale province in Turkey (Aylikci, et al., 2013).

Another study, Kofi & Donkor, (2014) found out that 66% (N=1107) high secondary school students in Cape town, South Africa accessed and received HIV prevention

messages sent to youth through online technology. Mobile phone message was potentially powerful tool for behaviour change because it was widely available, cheap and quick to transmit message among secondary school students. Thus, accessibility to internet technology determined the level of adoption of preventive behaviour against HIV infection among secondary school students in Cape Town, South Africa. Mass media was reported to be the leading source of information about HIV/AIDS preventive knowledge.

Therefore, these findings indicated that, mass media such as television and radio were significant variables that influenced process of adoption of preventive behaviours against HIV infection in secondary schools in Ghana (Kofi & Donkor, 2014). Accessibility to televisionôs information influenced adoption of preventive behaviours against HIV infection in schoolsô microsystems. Radio transmission, was another exosystem factor that influenced adoption of preventive behaviours against HIV infection. Radio broadcast has inherent strength of outreach to the clients and it is affordable to clients because it was cheap to buy radio set than television, radio was widely accessible in urban and rural areas, fast transmission of preventive knowledge against HIV infection, use friendly local and international medium of communication (UNESCO, 2001).

Also, radio used at community local level and cater in favour of specific needs of the clients about preventive behaviours against HIV infection in schools. Also, radio caters for National and International broadcasting needs. Radioôs message is credited of vividness of language, transparency, fast speech delivery, powerfulness speech, fluency language and plausible language. Radio programmes especially those

broadcasting at National or International level have caused significant behaviours changes as regards adoption of preventive behaviours against HIV infection in secondary schools and other ecological systems (UNESCO, 2001).

A study conducted by Odusanya and Bankole (2006) reported that in Ogun state, Nigeria, secondary school students received information about HIV from radio (77.1%), television (66.4%) and bill boards/ posters (73.4%) ,school teachers (22. 6%), church/mosque (20.9%), library services (11.8%) and internet (10.5%). These findings indicated that radio was the first source of HIV preventive education among secondary school students in Ogun state, Nigeria. This finding complied with those suggested by Nwimo & Omaka (2007) that, secondary school students in Imo state, Nigeria, reported that, their major sources of information about HIV/AIDS included radio. Also, another study conducted by Davhana-Maselesele *et al.,* (2007) suggested that learners in Vhembe District of Limpopo province reported radio as their main source of knowledge about HIV prevention particular in rural areas. A study, conducted by Bankole *et al.,* (2008) found out that secondary school teachers in Ogun state, Nigeria, obtained HIV prevention information from radio at the rate of 72.2% (n=371). Also, these teachers recommended radio as the appropriate channel to deliver preventive message to students in secondary schools at 55% level.

Likewise, Majeed *et al.,* (2010) reported existence of significant positive correlation between accessibility to preventive information through radio and tendency to adopt safe behaviours against HIV infection among students in Iran (Ghojavand, Einal, & Ghaeliniya, 2013) found out that, electronic media including radio was the main source of information to adolescents about HIV/AIDS preventive knowledge and

attitude at the level of 84% (N=250) among adolescents including secondary school students in Isfahan City, Iran.

Another study (Thanavanh *et al.,* 2013) reported that in Lao Peopleôs Democratic Republic, 75% (N=300) male high school students got information on HIV prevention from electronic media such as television, radio and internet. Ghasem, *et al.,* (2013) reported that in South ï Western Nigeria, electronic media such as radio and internet were frequent sources of HIV preventive information to youth in secondary schools at the rate of 59%. Television and radio programmes have been reported to cause significant behavioural change in response to adoption of preventive behaviours against HIV infection among adolescents (Delgado & Austin, 2007; Limaye, Rimal, Brown & Mkandawile, 2013; UNESCO, 2001). Therefore, these findings indicated that radio and television programmes were strong factors that influenced adolescentsô behaviour such as adoption of preventive behaviour against HIV infection among students in secondary schools in Ogun state, Nigeria.

Moreover, accessibility to print media, such as News papers was another exosystems variable that was reported to influence students to adopt preventive behaviours against HIV infection at microsystem level. The print media was credited by using cheaper price, national language such as Kiswahili in Tanzania, international language such as English, preservable, attractive photographs, attractive colours, readable language, accessibility and availability of print media. A study conducted by Nwimo *et al.,* (2007) reported that, print media, banners and posters were the main sources of HIV prevention among secondary school students in Imo state, Nigeria. The findings of this study complied with those reported by Davhana-

Maselesele *et al* (2007) that, news papers and pamphlets were the sources of prevention knowledge about HIV/AIDS among learners in Vhembe District of Limpopo province in South Africa.

Majeed *et al.,* (2010) reported that, News papers were found to be main factor that influenced studentsô attitudes towards preventive behaviours against HIV infection in high schools in Iran. Another study, Bankole *et al.,* (2008) reported that in Ogun state, Nigeria, secondary school teachers received HIV preventive information at the rate of 64% (n=329) from News papers. Also, the teachers recommended posters and pamphlets as the appropriate channel for delivering preventive information against HIV infection in secondary schools in Nigeria. This finding complied with those reported by Bamise, Bamise & Adedigba (2011) that secondary school adolescent in Ogun state Nigeria, reported mass media to be the most important source of HIV information. Hence, in the framework of Bronfenbrenner ecological systems Theory, news papers at exosystems level indirectly influenced the process of adoption of preventive behaviours against HIV infection among students in secondary schools at microsystem level.

However, the studies reviewed insufficiently reported vivid exosystem based determinants that influenced adoption of preventive behaviours against HIV infection among students in secondary schools settings. This was the knowledge challenge which this study intended to examine and filled the gap with valid and reliable findings presented in chapter four and five of this thesis report. In Tanzania, mass media such as new papers and radio were used to disseminate knowledge on preventive behaviours against HIV infection in schools microsystems in regions

including Njombe. These media were opted because were cheap and most available (Lugoe, 1996).

2.6 Summary of Empirical Literature Review and Knowledge Gap

Most studies reviewed indicated studentsô possession of high level of HIV preventive knowledge. However, other studies reported studentsô insufficient adoption and practice of preventive behaviours against HIV infection in secondary schools settings. The empirical literature reviewed provided little explanations about causes of insufficient adoption of preventive behaviours against HIV infection among secondary school students. This was the knowledge gap investigated by the present study. The dichotomy between high level of studentsô HIV preventive knowledge and low level adoption of preventive behaviours against HIV infection among secondary school students, justified to conduct the present study. The psychosocial determinants that regulated on adoption of preventive behaviours against HIV infection among students in secondary schools was critically examined with the guidance of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988). The next chapter presents research methodology of this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents research methodology which guided this study. The structures of this chapter includes: Research approach, research design, study area, target of the study population, sampling techniques and sample size, methods of data collection and pilot study. Other structures includes recruitment and training of research assistants, administration of tools for data collection, ethics codes for research, measurement scales, techniques and tools, data analysis plan, statistical procedures and presentation of findings.

3.2 Research Approach

The present study applied quantitative research approach. The origin of quantitative approach in research was well seeded in the positivist school of thought (Sarantakos, 1998). According to Cohen, Manion & Morrison, (2007), the positivism school of thought argue that, social phenomena and reality should be investigated along the guidelines of scientific description which is governed by laws and theories that regulated and amenable to empirical investigations (Omari, 2011).

In addition, the methods of physical sciences such as measurement, quantification, separation into variables (independent and dependent) mediating and formulation of general laws, need to be applied to the investigation, reporting and understanding of social sciences including human and non human animalôs behaviour (Barker, Pistrang & Elliot, 2005). The application of quantitative research approach into psychological studies dates back to behaviourism school of thought. The proponents

of this methodology were John Watson and B.F Skinner (Cohen *et al.,* 2007; Feldman, 1999). Positivism school of thought believed that sensorial experience, observation and reasoning were the most recommended methods for investigation and understanding behaviours of human being and advanced only by means of experimentation and observations (Cohen *et al.,* 2007; Mouly, 1978).

Moreover, quantitative research approach was opted and used in this study because it facilitated the following scientific research processes: Enhanced use of quantitative research methods and tools such as questionnaires and documentary analysis. These tools enhanced to cover large sample of 1,000 students of secondary schools in Njombe region, Tanzania. Also, questionnaires generated quantifiable empirical data that could be subjected to correlation and regression statistical analysis. As a result, the empirical data facilitated to examine and conclude the hypotheses of this study.

Likewise, the quantitative research approach in this study facilitated to generate objective data which were observable, measurable, quantifiable, and could be statistically processed to determine significance of the findings (Locke, Spirdaso & Silvermdn, 2007). The data related to items of perception, microsystem and exosystem were predicted as determinant variables that influenced adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Also, quantitative research approach enhanced impartiality of the investigators. In this study, the investigators remained outside the classrooms, when students were completing self administered questionnaires. This process prevented influence of the researchers to the respondents. Thus, the respondents were free to complete the questionnaires as they perceived to be deemed

correct.

Furthermore, the quantitative research approach facilitated verification of study variables leading to test the null hypothesis. As reported by Omari, and Sumra (1997) as well as Omari, (2011), the structured questionnaires were constructed in advance at The Library of The Open University of Tanzania. The questionnaires contained structured objective questions, which had both premises and responses. The respondents were asked to tick any one structured response in relation to predicted items of perception, microsystem and exosystem variables determined level of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Thus, the structured questionnaires (Appendix A) were just verified by respondents as they perceived correct. Moreover, in this study, quantitative research approach facilitated to put more effort on process of conducting the study, process oriented. This study put more emphasis on accuracy of the research methodology which leads to ensure validity, reliability and acceptability of the findings.

Similarly, quantitative research approach enhanced falsefiability of the hypothesis as reported by Fife-Schaw (2012). This study was guided by three null hypotheses which were subjected to empirical correlation and multivariate regression statistical analysis to examine if the null hypothesis were significant or not. The null hypotheses, in this study, were stated such that they could be accepted or rejected to comply with scientific requirements as advocated by positivism philosophical school of thought (Cohen *et al.,* 2007; Omari, 2011). Also, quantitative research approach facilitated, use of quantification and approved measurement scales. This pertained to

assigning numbers to predicted items of perception, microsystem and exosystem independent variables according to approved rules as recommended by Fife-Schaw, (2012). As a quantitative study, the study used nominal scales, ordinal scales and ratio scales depending upon the nature of data collected. The study also used structured questionnaires special constructed in summative rating Likert scales (Appendix A) (Cozby, 2007; Elmes, Kantowitz & Roediger III, 2012).

Quantitative research approach allowed use of research focused tools and variables, as documented by (Cohen *et al.,* 2007; Omari, 2011; Shenoy & Pant, 2005; Tripp-Reimer, 1985) .This study focused on measurement of controlled, structured items in relation to perception, microsystem and exosystem variables that were predicted to determine process of adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania.

The details of independent variables included items of perception variable such as credibility of preventive knowledge. Also, the items of microsystem variable such as socialization in schools and items of exosystem variable such as accessibility to televisionôs message. These variables were naturally manipulated by changes of ecological system forces of Njombe region as framed in the Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1979; 1988). In addition, quantitative research approach enhanced to determine scope of measurement of variables of the present study. This study focused on particularistic, specific, measurable, observable and quantifiable study variables related to independent variables of perception, microsystem and exosystem. These variables were predicted to determine process of adoption of preventive behaviours such as avoiding alcoholism against HIV

infection among secondary schools students in Njombe region, Tanzania.

Likewise, quantitative research approach enhanced structuring the environment used to complete the questionnaires. The settings of this study were structured and controlled classroom environment. Selected respondents students gathered and completed self reporting questionnaires in classrooms at their schools premises. Conducive controlled classroom settings facilitated validity and reliability of the questionnaires tools of data collection as well as findings of collected data. The structured setting facilitated to collect data that were objective, measurable, observable and quantifiable outcomes among independent variable such as perception, microsystem and exosystem variables. Also, quantifiable predicted dependent variable such as preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, was captured.

Similarly, the quantitative research paradigm, allowed this study to use various correlation and regression analysis statistics methods. In particular, in this study, quantitative research approach enhanced use of inferential statistics such as Pearson product moment correlation coefficient test; multivariate regression analysis and multivariate logistic regression analysis technique. These statistical tools facilitated to examine significance of the findings for this study. Also, correlation and regression statistical techniques facilitated to test and conclude the research hypotheses that guided this study.

Moreover, in this study, quantitative research approach facilitated statistical analysis to determine quality of the tools of data collection. Quantitative research approach

allowed the tools for data collection to be subjected to statistical test to determine level of their probability statistical significance. Therefore, it was important to apply quantitative research approach to facilitate verification of validity and reliability of the tools and findings of this study. However, qualitative research approach was used at lower level. This approach enhanced to collect real and natural data which complimented the quantitative data (Cohen *et al.,* 2007; Puch, 2004 &Wilkson, 2007). Qualitative research approach guided data collection process related to independent variables and dependent variable of this study. These variables were perception, microsystem and exosystem variables while dependent variable was adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania (Appendix B).

3.3 Research Design

3.3.1 Correlational Research Design

According to Franzoi (2000), correlational research design aims at investigating the nature of the relationship between one naturally occurring independent variable and one dependent variable. In the present study, the variables were thought to be naturally manipulated by the dynamic changing ecological systems forces. Changes in a value and functions of the independent variable such as perception, microsystem and exosystem would trigger changes in a corresponding value of the dependent variable such as adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Accordingly, Phares (2003) noted that, correlational research designs investigated existence of relationship between one independent variable and one dependent variable that function

simultaneously in natural settings.

In this study, correlational research design was preferred because it allowed examining relationship between an independent variable and one dependent variable. Also, in this study, the independent variables were measured by using items of Perception variable such as studentsô belief of: Credibility of preventive knowledge, susceptibility to HIV infection, primacy effects of knowledge and self efficacy expectancy. Again, items of microsystem variables such as; supportive socialization in schools, families, Church / Mosque, health care systems and peer groups. Lastly, exosystem variables: for example accessibility to message through television, internet, radio and print media. These details of independent variables were predicted to determine process of adoption of preventive behaviours such as use of VCT services, against HIV infection among secondary school students in Njombe region, Tanzania.

In addition, as reported (Cohen *et al.,* 2007), correlational research design, was preferred because it enhanced three tasks about the analysis of independent variables and dependent variable, in this study, namely: Firstly, examination of the existence of a significant relationship between independent variables and dependent variable, as depicted in the research conceptual model presented in chapter two of this study and process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Secondly, the correlational research design facilitated exploration of the existence of significant direction of relationship being positive or negative. Thirdly, it enhanced analysis of the strength of the relationship between independent variables and dependent variable as

presented in chapter four of this study.

The magnitude of the relationship between independent variables and dependent variable indicated the degree of accuracy with which the investigator could predict the value of the dependent variable when the value of the corresponding independent variable was known as documented by researchers (Franzoi, 2000; Horowitz *et al.,* 1995). The existence of significant relationship, direction and strength of relationship between independent variable and dependent variable was indicated by a statistical numerical index called correlation coefficient (r). The application of the correlational research design also was used because it facilitated presentation of the findings using scatter plot, equation and regression line.

As such it was possible to assess the quality of findings graphically and the degree of relationship between independent variables and dependent variable. However, it is important to note that, correlational research design cannot establish causality effects between independent and dependent variables. In the natural situation the study variables were manipulated by natural ecological systems forces during data collection process (Franzoi, 2000).

3.3.2 Cross Sectional Research Design

In the present study it was necessary to investigate a sample of different respondents with different socio-demographic characteristics at once. The study sample had different characteristics such as gender, age, religious affiliation, educational levels, geographical residence and academic backgrounds (Heppner, Wampold & Kivlighan, 2008; McMillan, 2008; Newman, 1997; Phares, 2003). As such the study

deployed a Cross- sectional research design and was capable of facilitating high participation rate among respondents. The uses of questionnaires reduced attrition rates among the respondentsô as the questionnaires were administered at once only (Cohen *et al.,* 2007). It was comparatively cheaper and saved time to administer the tools for data collection process at once (Cohen *et al.,* 2007; Kombo & Tromp, 2006; Mcmillan, 2008).

In addition, beside practical benefit of using a cross- sectional research design, it facilitated the analysis of the collected data using the characteristics of a sample including socio demographic characteristics such as gender, age, education level and religious affiliation. A large sample obtained for this study enabled to perform effective statistical analysis. However, the cross sectional methodological procedures appeared to be less effective in examining the trend of changes of the independent and dependent variables. Thus, in this study it was difficult to establish the trend of predicted perception, microsystem and exosystem variables as determinants of process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. In this study the trend of perception, microsystem, exosystem and process of adoption of preventive behaviours could not be established because of short time used during data collection in the field (Cohen *et al.,* 2007).

3.4 Study Area

In a cluster of 30 regions of Tanzania, purposive sampling technique was used to get Njombe region as study area. Increased HIV infection rates in Njombe region attracted the investigator to opt Njombe region as the study area. In 2007/08 year,

Njombe region was part of Iringa region and reported the highest HIV/AIDS infection prevalence rate of 16% compared to other regions in Tanzania (TACAIDS *et al.,* 2008). However, in the third Tanzania HIV/AIDS and Malaria indicator survey (2011-12), Njombe a newly designated region reported a high HIV infection prevalence rate of 14.8% in Tanzania (URT, 2014c). A high HIV prevalence rate prompted a need to investigate and understand the determinants on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. This region is located in The Southern Highlands, Tanzania.

3.5 Target Population

According to The Ministry of Education, Science and Technology, report (URT, 2014b) there were a total of 41072 secondary school students enrolled in Form One to Form Six in 2013 in Njombe region. The target population of this study was 41,072 secondary school students aged 15-23 years. Likewise, there were 109 secondary schools in Njombe Region (URT, 2014a). This population has been reported to mostly engage into HIV risk behaviours such as practising alcoholism, drug abuse, peer group influence, multiple sexual partners, increased libido, sexual experimentation and insufficient use of VCT services. Also, the secondary school studentsô population have high level of awareness of HIV prevention knowledge, but fail to adopt the preventive behaviours against HIV infection in secondary school settings. Therefore, it was important to opt and use the secondary school students as a target population for this study which generated the findings reported in this thesis report.

3.6 Sampling Techniques and Sample Size

3.6.1 Sampling Techniques

These were strategies used to select respondents from the population and then included into the sample of this study. The probability sampling techniques used included simple random sampling technique, and multistage sampling technique. Probability sampling techniques were employed because it enhanced each student respondent to possess an equal chance of being picked and included into the sample (McMillan, 2008; Shaughnessy, Zechmeister & Zechmeister, 2000; Sturgis, 2012).

Multistage sampling technique entails research methods of creating clusters of sources of data at various stages to facilitate to get required representative respondents (Kothari, 2012). Multistage sampling technique was used to get the required sample. First stage, regionsô cluster of Tanzaniaôs 30 regions. The sampling unit was a region. Purposive sampling technique was used to select Njombe region due to its high HIV infection prevalence rate of 14.8% (URT, 2014c).

Second stage was Town and District councilsô cluster. Sampling unit was a council. Sampling frame was a list of councils in the entire Njombe region. By using simple random sampling technique, and Lottery method, Njombe Town and Makambako councils were selected. Also, Makete, Njombe and Wangingôombe District councils were selected. Third stage was secondary schoolsô cluster in which sampling unit was a secondary school. Sampling frame was a list of secondary schools in each selected Town Council or District council. Using simple random sampling technique, 12 secondary schools were selected as representative of 109 secondary

schools in Njombe region (URT, 2014a). Each council contributed two secondary schools selected by using simple random sampling technique.

However, Njombe Town council and Njombe District council each contributed three secondary schools as they hosted many secondary schools. Fourth stage was a studentsô cluster, in each selected secondary school. Studentsô class attendance register was used as sampling frame. Simple random sampling technique and Lottery method was used to identify a sample of 100 students in each selected secondary school as representative sample of the target population.

Secondary schools with few candidates, each contributed 60 students. The sampling unit was an individual student. The sampling frame had chronologically arranged and fixed interval of number of students in each randomly selected school in Njombe Region, Tanzania. The target population was form three, four, five and form six students. These students had knowledge about preventive behaviours against HIV infection among secondary schools students, the entire sample size consisted of 1,000 students.

Multistage sampling technique was preferred because it combined various sampling techniques such as simple random sampling technique and cluster sampling technique. Also, multistage sampling technique provided equal chances for each secondary school and each respondent to be included into the sample (Denscombe, 2005; McMillan, 2008).Sample composition included respondents with different gender, age, education level and religions as reported. This composition facilitated validity and reliability of the findings of this report.

3.6.2 Sample Size

A big sample size of the study was needed as recommended by Best *et al.,* (2006) higher numbers of respondents were needed to improve validity and reliability of research findings. With probability sampling techniques, statistical formula was applied to determine the number of respondents required to constitute the sample size for this study (McMillan, 2008). Thus, according to Kothari (2012), the sample size for this study was determined by using the following formula:

$$n = \frac{Z^2 в^2 pN}{[N-1]\, e^2 + Z^2 ß^2 p}$$

Where: N = Size of the study population of secondary school students of Njombe region = 41072 (URT, 2014b).

n = Sample size of the study

ßp = Assumed standard deviation of the population = 0.82

e = Level of significance = 0.05

Z = Table value under normal curve for the given confidence level of 95% is (1.96)

$$n = \frac{(1.96)^2(0.82)^2(40172)}{(41{,}072-1)(0.05)^2 + (1.96)^2\,(0.82)^2}$$

n = 999.569

Hence, the sample size was 1000 respondents.

The sample composition captured respondents across socio demographic variables such as gender, age and education levels. These background variables were preferred as they enhanced cross tabulation and comparative analysis of study findings as presented in chapter four of this report.

3.7 Methods of Data Collection

3.7.1 Questionnaire

Questionnaire tool of data collection contributed much information in this research as source of knowledge leading to understand the independent and dependent variables of the study (Newman *et al.,* 2003). Questionnaire tool of data collection was used in this report to collect primary data from the secondary school students with regards to items of perception, microsystem and exosystem variables determined process of adoption of preventive behaviours such as use of VCT services, against HIV infection among secondary school students in Njombe region (Appendix A).The items of variables were constructed within the perspective of Social psychology domain and Bronfenbrennerôs Ecological Systems Theory.

In addition, special structured questionnaires were prepared with specific constructed premises. Responses were coded in likert scales that indicated agreement, neutral and disagreement options (Appendix A). The secondary school students respondents were asked to tick only one option to indicate their believes about items of perception, microsystem and exosystem variables determined the process on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, by using self reporting questionnaires (Alreck & Settle, 2004).

Also, in this study questionnaires contained scaled, specific, and simple responses that enhanced respondents to use short time of one hour only as recommended by researchers. (Alreck *et al.,* 2004; Hart, 2008; McMillan, 2008; Mukherji & Albon, 2015; Saunder *et al.,* 2012). The respondents were asked to indicate only one option to reflect their understanding about the premise statement. As reported by Kothari (2012), questionnaire tools of data collection was used to elicit data from a sample size of 1000 secondary school students in twelve secondary schools in Njombe region. Also, as reported by Massomo & Ngaruko (2012) questionnaires enhanced collection of data in a large spread geographical area. In this study, questionnaires were used to collect data because they facilitated confidentiality of respondents during the process of completing the tools. Also, questionnaires used short time, covered large sample and enhanced to examine validity and reliability of the tools of data collection and findings presented in chapter four of this report.

Furthermore, in this study the questionnaires (Appendix A) captured the following data: First, socio-demographic and predictor variables such as gender, age, education level, religious affiliation, location of school, composition of school, ownership of school and residence of students (Appendix A). These data was collected because they facilitated analysis of sample composition of this study. Also, demographic variables such as gender facilitated cross tabulation of statistical analysis of the findings of this study as presented in contingency tables in chapter four of this study.

Secondly, items of perception variables such as studentsô beliefs of: credibility of preventive knowledge, susceptibility to HIV infection, primacy effects of knowledge delivered to empower students, benefits of preventive behaviours, life skills learning

to empower students to adopt preventive behaviours and self-efficacy to preventive behaviours against HIV infection among students (Appendix A). The detailed variables were intended to facilitate testing the first null hypothesis and were measured in frequency of occurrence of behaviour (Shaughness *et al.,* 2000). Thirdly, items of microsystem variable such as studentsô beliefs of: receiving social supportive socialization in schools, families, Church/Mosque, counselling in health care systems and peer group systems. These variables facilitated testing the second null hypothesis and were measured in frequency of occurrence of behaviour, (Shaughness *et al.,* 2000).

Lastly, items of exosystem variables such as studentsô beliefs of: accessibility to television, internet, radio and print mediaôs message on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. These variables facilitated testing the third null hypothesis and were measured in frequency of occurrence of behaviour (shaughness *et al.,* 2000). The Bronfenbrennerôs Ecological systems Theory and Social psychology domain guided the preparation of items and responses of questionnaires for this study. To score the completed questionnaire, respondents were asked to tick only one option in each questionnaire. The responses were either in nominal scale, ratio scale or ordinal scale. Thus, data analysis used the required statistical tool.

3.7.2 Documentary Analysis Method

The investigator analyzed documents such as those published by the National Bureau of Statistics of Tanzania, UNESCO, NACP/ TACAIDS, Ministry of Education, Science and Technology, Tanzania Demographic Health Survey and WHO. Content

analysis and statistical interpretation techniques was used to extract relevant secondary data for this study. Secondary data information obtained from already published printed materials (Turabian, 1983). In this study, secondary data were used because such data were authentic, correct, most available, and accessible and served time. In the context of this study, secondary data used included the target population of secondary school students in Njombe region. The students were 41,072 (URT, 2014 b).

This figure was used to calculate the sample size of this study. Also, documentary analysis method accessed highest HIV infection prevalence rate of 14.8% (URT, 2014) reported in Njombe region, Tanzania. Again, secondary data facilitated triangulation process to ascertain validity and reliability of the findings of primary field data presented in chapter four in this thesis. Also, documentary review method collected data that was used to verify findings in discussion in chapter five in this report.

3.7.3 Focused Group Interview

Focused Group Discussion (FGD) method was used to collect natural qualitative data that complimented quantitative data in this study. In the present study, themes for discussion focused on perception variable related to studentôs belief on credibility of preventive knowledge against HIV infection. During conducting FGD, students added importance of adhering to confidentiality issues to facilitate uptake of preventive behaviours against HIV infection. Susceptibility to HIV infection, self-efficacy expectancies to preventive behaviours against HIV infection, and invulnerability to HIV infection among secondary school students in Njombe region.

Similarly, microsystem variables related to: Student beliefs on receiving social supportive socialization in schools, families, Church/Mosque, health care systems and peer groups systems were discussed. However, during conducting FGD, students added importance of tradition initiation rites as a means of communicating uptake of preventive behaviours against HIV infection to young people. Also, respondentsô reported that, traditional culture prevents open communication about reproductive health issues including uptake of preventive behaviours against HIV infection in schools in Njombe region. Thus, uptake of preventive behaviours was communicated to young people through credible adults of the approved gender and age in families only and not in schools in Njombe region.

Lastly, exosystem variable covered in FGD included clientsô accessibility to message from television, radio, print media and advocacy using drama (Appendix B). Thatôs, focused group discussion was used as supplementary instrument to questionnaire tools of data collection. Focused group discussion elicited natural, subjective and focused data that enhanced triangulation and verification of validity and reliability of field primary data elicited through self reporting questionnaire tools of data collection (Appendix A). Moreover, in the present study, collection and analysis of qualitative data was guided by the qualitative research approach as suggested by researcher (Eatough, 2012). The study involved 12 secondary schools in its sample size. Each secondary school provided one FGD. As a result, the entire study had 12 FGD. Also, each FGD had 10 participants.

The FGD was composed of heterogeneous socio demographic characteristics. Gender balance was ensured in each FGD, to facilitate equality of findings from both

males and females participants in this study. The composition of FGD was as follows: Each group had 10 participants. Into the group there were 5 males and 5 females respondents. On the basis of education level, each group had 5 students for ordinary level and 5 students for A-level. In terms of handling the FGD, each group was supervised by a research assistant. This assistant captured all required data arised into the FGD. The content analysis method was used to analyze data generated from FGD in this study. To determine validity and reliability of the tools (Appendix B), the supervisors of this study reviewed and approved the tools of the FGD. Lastly, the investigator compared correctness of data from FGD and documentary analysis method to verify validity and reliability of the tools and findings of FGD.

3.8 Pilot Study

Four secondary schools from Njombe region were used for a pilot study. These schools were not included in the main study of data collection. Each school contributed 25 students leading to 100 secondary schoolsô students who participated into the pilot study. The schools used in the pilot study, had similar characteristics to the schools used in the main field work. The characteristics considered included, co-education, location of school in urban or rural settings and ownership, being public or private school.

In addition, the pilot study was most significant as it enhanced identification of errors that could cause difficulties in completing the questionnaires among secondary schoolsô student respondents. Pilot study also, enhanced editing questionnaires, restructuring the tools, checking time required for completing the

questionnaires without causing stress among respondents. Also, the investigator learnt and made correction of ambiguous words and ensured clarity of instructions to the respondents to facilitate correct completion of the questionnaires without the presence of investigators.

Pilot testing of instruments of data collection such as questionnaires was intended to validate tools, make correction and improve the precision, reliability and validity of the tools of data collection for this study. Also, pilot study enhanced to learn ecology systems of the study area and correlated with the independent variables, that was perception, microsystem and exosystem variables and the dependent variable of the study that was adoption of preventive behaviours against HIV infection among students in secondary schools in Njombe region.

Also, analysis of pilot studyגs data lead to editing and restructuring difficulty concepts and sentences leading to good quality questionnaires and interview schedule for this study (Appendixes A & B). For example, the concept, questionnaire was elaborated that it was not a test; it was a scientific tool of data collection. During pilot study, findings indicated that, all respondents were good in Kiswahili language than English language. As a result, all questionnaires were translated into Kiswahili language. Consequently the questionnaires were correctly completed within a given one hour time. Also, all typing errors were corrected. Instructions at cover page were improved and enhanced correct completion of the questionnaires.

In addition, validity in this study signify the truth and correctness representation of tools of data collection and data collected as expected (Cohen *et al.,* 2007; Cozby,

2007). In the study the instruments were assessed its appropriateness and ability of the tools for data collection, such as structured self reporting questionnaires to measure and gather accurate data that responded to the research objectives and research hypotheses of this study (Coolican, 2009; Elmes *et al.,* 2012; Ngatia & Ngunga, 2006). Also, validity referred to improve correctness of the findings of the study such that comply with objectives and research hypotheses of the present study. Pearson product moment correlation coefficient test and Sperman-Brown formula was used to determine the reliability coefficient of the questionnaire tools of data collection, during pilot study.

In addition, during pilot study, reliability of the tool of data collection was examined, improved and maintained in this study. Reliability, signify consistency, dependability, repeatability and precision of instruments of data collection such as questionnaires across different times and different sample (Barker, Pistrang & Elliot, 2005; Best *et al.,* 2006; Elmes *et al.,* 2012). Again, reliability refers the degree to which the tools of data collection could generate quality consistency research findings in different samples of respondents, settings and time (Mcmillan, 2008). Also, reliability indicates stability of tools and measures of behaviours for data collection producing constant findings each time when the tools were administered.

Similarly, during pilot study a sample of questionnaires was subjected to Pearson product moment correlation coefficient test and found the coefficient to be equal to *(r= 0.73)*. Then, this coefficient was subjected to Spearman- brown formula so that to calculate the reliability coefficient and it was found to be equal to (*r= 0.84*). Thus, the questionnaires as tools of data collection for this study had high level reliability

coefficient of 0.84 (100), equivalent to 84%. This level was acceptable quality and yielded acceptable research findings as recommended by (Cohen *et al.,* 2007). Likewise, during pilot study to examine internal consistency reliability of the questionnaires as tools of data collection, Cronbachôs alpha coefficient was used as recommended by various researchers (Cohen *et al., 2007*; Fishers, Eke, Cance, Hawakins & Lam, 2008; Saunder *et al., 2012*).

In this study, Cronbachôs alpha coefficient was calculated and found to be *(Cronbach's alpha= 0.96*) equivalent to 96%. Therefore, this alpha coefficient demonstrated that the questionnaires as tools of data collection in this study was reliable and were of acceptable quality at 96%. As a result, the findings of this study were of reliable and acceptable quality status. Similarly, during pilot study, triangulation method was used in this study to ensure validity and reliability of tools of data collection and its findings in this study. Triangulation process involved use of various instruments of data collection to simultaneously gather data for this study.

To improve validity and reliability of findings of this study, data collection process used survey method and structured objective questionnaire tools of data collection. Also, documentary analysis methods as well as FGD methods were simultaneously used to collect data for this study. The data generated by various methods and tools of data collection was compared and found to be similar. Thus, in this study, similarity of data collected by different instruments of data collection, verified the validity and reliability of tools of data collection and findings for this study. In addition, to improve validity and reliability of instruments (questionnaires) in this

study the following methods were used: Translation of the questionnaires from English version into Kiswahili language, Tanzaniaôs National language, so that respondents could comfortably complete the questionnaires. Use of appropriate objective structured questionnaires which contained particularistic, objective questions which were easy to respond and pick the appropriate option (Appendix A).

Moreover, the investigator ensured heterogeneous composition of respondents into the sample of this study. This was in the context of socio demographic characteristics such as gender, education level, religionôs belief, location of schools, ownership of schools and composition of schools (Appendix A). Also, the investigator increased knowledgebility of respondents about the research problem, specific research objectives, research hypotheses and significance of this study. Higher knowledge about this study among respondents increased validity and reliability of tools of data collection and its findings of this study. In addition, the investigator ensured clear, precise, direct and correct instructions given to guide respondents to correctly complete the instruments of data collection such as questionnaires (Appendix A). Also, used approved attitude measurement scales such as summative rating Likert scales as documented by (Oppenheim, 2000; Saunder *et al.,* 2012: Shaughness *et al.,* 2009).

3.9 Recruitment and Training of Research Assistants

The procedure involved presenting the clearance letters to the head of selected secondary schools. Twelve secondary schoolsô teachers, from twelve secondary schools (one academic teacher from each secondary school) with gender balance, were recruited. These academic teachers had good experience in research process as

well as counselling skills for youth in secondary school settings, in relation to reproductive health challenges faced adolescents in secondary schools.

Prior to performing actual data collection, the research assistants participated in one day intensive training about research practices. In particular, the research assistants learnt about briefing on the title of this study, specific research objectives, research hypotheses, significance of this study, preventive behaviours against HIV infection among secondary school students in school settings, data collection procedures, administration of questionnaires and conducting focused group discussion session with students. Also, the research assistants learnt research ethics according to the Tanzania Commission for Science and Technology (COSTECH) and The American Psychological Association (APA, 2001).

The research assistants and respondents were informed about their freedom to volunteer or withdraw in the process of data collection. However, the students and research assistants were kindly asked to participate correctly in the process of conducting this study on the basis of the significance of this study to prevention services that rescue our esteemed secondary school students in Njombe region, Tanzania. Again, the research assistants were briefed about the work schedule and confidential preservation of data collected through questionnaires and focused group discussion (Appendixes A & B). To correctly instil skills on data collection process, the research assistants practically performed actual process of reviewing the entire questions into the questionnaires and interview schedule (Appendixes A & B). Also, the research assistants practiced administering the questionnaires as well as practiced the actual interviewing process.

3.10 Administration of Tools for Data collection

The questionnaires were administered in classrooms after normal class sessions. The classrooms were most convenient venues as they possessed silence settings. The students completed the questionnaires individually and responded well depending upon instructions given at the cover page of the questionnaires and instructions given to individual specific question. Before submitting the questionnaires, the research assistants checked completeness of the tools for data collection. The investigator and the research assistant used such opportunity for monitoring the quality of data collected by using the questionnaires). Time for filling the questionnaires was one hour.

Similarly, FGD were conducted in groups of ten students. The research assistants were around and captured the information delivered into the group discussion as guided by the interview schedule (Appendix B). In conducting FGD, the themes and sub themes covered included: Firstly, perception variables such as credibility of preventive knowledge against HIV infection among students and susceptibility to HIV infection among students. Secondly, microsystem variables, such as receiving social supportive socialization in schools, families, churches or mosques. Thirdly, exosystem variable such as accessibility to television, internet, radio and print mediaôs messages (Appendix B. Focused Group Discussions, also, used the same duration of one hour.

3.11 Ethics Codes for Research

Ethics pertains to morality standards that guide the conduct of behaviours of the investigator (Frolov, 1984; Mukherji *et al.,* 2015). This study adhered to

philosophical ethical principles such as autonomy, beneficence, non maleficence, justice and fidelity as suggested by (Houser, 1998). Autonomy indicates self-rule and self- choice. This included full disclosure of information leading the respondents to make an informed decision and choice whether to participate in research process or withdraw.

Also, the principle of autonomy refers that, participants in a research were treated as having autonomy such that they were capable of making deliberate decisions regarding whether to volunteer participation into the research process or refuse. In the context of The American Psychological Association (APA) and The Tanzania Commission for Science and Technology (COSTECH)ός Ethics of codes of research, this study adhered to the following codes: Informed consent and confidentiality.

The investigator and research assistants informed the respondents about the title, specific research objectives, research hypotheses, significance, risks and benefits of participation, data collection procedures, confidentiality and privacy of information released by the respondents for this study. The respondents were informed that the information gathered in this study, strictly was used for academic purpose only. Also, the respondents were informed that, they had freedom and rights to volunteer to participate or withdraw in this study as reported by (Cozby, 2007; Houser,1998).

In addition, beneficence refers to doing best actions as approved by the codes of ethics for research. The investigator of this study elaborated maximum benefits out comes generated by this study. The investigator ensured direct benefits to the

respondents such as acquiring skills in performing scientific research, learning perception, microsystem and exosystem variables that influenced level of adoption of preventive behaviours such as use of VCT services against HIV infection among secondary schools students. Also, the participants were reminded that, the knowledge and findings generated through this scientific research will improve HIV prevention services and educational policies in relation to HIV prevention intervention services in secondary schools in Njombe region, Tanzania.

Moreover, Non maleficence implies avoiding doing intentional harm to the participants in the process of conducting the scientific research (Cozby, 2007; Houser, 1998). In the study, the investigator minimized any possible harmful effects to the respondents. In the questionnaires, the researcher avoided open ended questions which demand much thinking and time from the respondents. As a result cause stress to respondents. Thus, to reduce stress, this study used open ended questions in the questionnaire.

Moreover, the researcher performed the risk-benefit analysis about this study. That, this study had risk of using cost in money and time but simultaneously this study generated knowledge in findings which could enhance HIV prevention services in secondary schools in Njombe region. As a result, the students in secondary schools could be rescued against HIV pandemic in school settings. To minimize psychological constrains of time scarcity, this study scheduled only one hour for completing questionnaires or attending a focused group discussion among respondents. Also, the process of data collection was performed in the evening after normal class sessions.

Thus, data collection process didnôt interfere normal teaching and learning schedule. Again, to minimize psychological hazards, confidentiality of the respondents and the data released was assured. Names or code numbers were not requested into the questionnaires or interview scripts to ensure confidentiality of the respondents and schools. The investigator and research assistants carefully preserved the questionnaires and interview scripts in special sealed envelopes and reserved in bags such that no one could access the documents except the investigator only.

Furthermore, justice fair distribution of knowledge resources (Houser, 1998). This idea complied with communalist of knowledge ownership and consumption. Thus, knowledge ought to be shared by all members of the universe community, because knowledge involves understanding human being and the universe which host human beings. Also, research findings ought to possess universalistic explanation. That, research findings ought to possess truth everywhere across the universe, for most human being and during most of the time.

In addition, in this study fairness in receiving benefits of research of this study was reflected in dissemination of findings of this study. The copies of this report were submitted to the authority of The Open University of Tanzania for examination and finally were deposited in the Directorate of library services of The Open University of Tanzania. These copies could be used by policy makers, policy implementers, researchers and academicians in relation to improving efforts for HIV prevention intervention services in secondary schools in Njombe region, Tanzania.

The respondents benefited through implementations of policies with regards to HIV primary, secondary and tertiary prevention services in secondary schools. Other

copies were submitted to the supervisors of this study and used in teaching, research, consultancy, community services and publication services, which are the core functions of the university, as recommended by Mwalimu Nyerere (Nyerere, 1968). Another copy of the thesis remained with the candidate who is a lecturer in social psychology. This copy was used as a teaching and learning aid in various academic institutions served by the candidate of this study. Also, institutional approval entailed the investigator to provide accurate information about the research report and declaration to observe approved codes of ethics for research as approved by COSTECH.

In this study, the investigator asked and obtained the institutional approval letters from appropriate authorities. These authorities were: The Vice Chancellor, The Open University of Tanzania, and The Regional Administrative Secretary of Njombe region, Director, Njombe Town Council, Director, Njombe District Council, Director, Wangingôombe District Council, Director, Makambako Town Council, Director, Makete District Council and Declaration of confidentiality (Appendix H). Also, prior to conducting the research process of this study, the investigator asked informed consent from the Head of each secondary school selected into the sample on behalf of parents and the secondary school studentsô respondents.

In addition, protection from harm and debriefing, the investigator took appropriate measures to reduce the risks that could harm the respondents such as problems of time constrains. Thus, to reduce time constrains the questionnaires contained structured objective questions that were simple to provide answers as recommended. Hence, this study strictly adhered to ethical codes of research as recommended

related to autonomy, beneficence, justice, non maleficence, fidelity, responsibility, integrity, honest, respect and good welfare of respondents as documented by other studies (Cozby, 2007; Haslam, 2014; Houser, 1998; Mukherji, *et al.,* 2015).

3.12 Measurement Scales, Techniques and tools

3.12.1 Measurement Process

In psychological studies, measurement entails process of assigning numbers or codes that indicates different quantity values of variables. Numbers used to describe and differentiate attribute characteristics of variables (Cozby, 2007; Elmes *et al.,* 2012). Measurements involved quantification of independent variables and dependent variable such that they could be subjected to statistical analysis and presentation of findings in contingency tables, scatter plots and graphs (Fife-Schaw, 2012).The variables originated from the theoretical framework (Figure 2.1) and conceptual framework frame work (Figure 2.2) presented in chapter two of this study.

In this study, measurement process intended to obtain empirical primary data about the independent variables such as perception, microsystem and exosystem variables determined process of adoption of preventive behaviours, against HIV infection among secondary school students in Njombe region, Tanzania. Also, in this study, measurement enhanced to measure the dependent variable that was process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

3.12.2 Measurement Scales

These are levels of measurement that guided the investigator to structure the data and selected appropriate statistical test, analysis and presentations of findings. These

scales were nominal, ordinal, interval, and ratio measurement levels (Fife-Schaw, 2012; Haslam, *et al.,* 2014; McMillan, 2008). Nominal scale has no quantitative value and has no qualitative value (Cozby, 2007; Greene & Oliveira, 2003; Howitt *et al.,* 2003; Saunder, *et al.,* 2012). In this study, nominal scale enhanced to measure socio-demographic characteristics of the respondents. These data included age, gender, education level, religion affiliation, school location, ownership, school composition and residence of students as presented in chapter four in this report. Ordinal scale was used to measure and analyze ordinal data that were ranked in summative rating Likert type scale.

Moreover, ratio scale, facilitated measurement of data that were in form of frequency of occurrence of behaviours (Shaughness *et al.,* 2000).Ratio scale is most powerful, accurate and precise, has quantitative value and complies with various statistical tests (Cozby, 2007; Haslam *et al.,* 2014; Howitt *et al.,* 2003). In this study, ratio scale was used to measure ratio data that involved count frequencies of responses for selected questions used to test the null hypotheses.

3.12.3 Measurement Techniques and Tools

These entailed procedures of assigning numbers to attitudinal scale that indicated various degrees of psychological constructs determined level of respondentôs agreement or disagreement to declarative premises (Kothari, 2012). In this study, specific constructed summative rating Likert type scales and self reporting questionnaires was constructed and used to measure detail items of independent variables and dependent variable as recommended by (Aleck *et al.,* 2004; Fife-Schaw, 2012, Oppenheim, 2000). Specifically, the independent variables measured

included items of perception, microsystem, and exosystem variables predicted to determine process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region (Appendix A).

Similarly, questionnaires with summative rating Likert type scales, was easy to label and code values for each response and enhanced the respondents to complete the questionnaires correctly within short time of one hour. Again, questionnaires with summative rating Likert type scale enhanced the process of data analysis, interpretation and systematic presentations of findings in contingency tables in chapter four and in Appendices of this report.

Likewise, the questionnaires with summative rating Likert type scale, enhanced statistically to calculate correlation coefficient (rho) which explained the direction, magnitude and closeness of association between items of independent variables and dependent variable of this study. Summative likert type scale provided wide alternative levels of responses depending upon the understanding of respondents in this study. The summative Likert type scale is powerful, widely used and useful in educational research as reported by Cohen *et al.,* (2007). To score the completed questionnaires, the respondent was asked to tick only one option in each questionnaire. The responses were either in nominal scale, ratio scale or ordinal scale. Thus, data analysis used appropriate statistical formula depending on the measurement scale used in coding questionnaires.

3.13 Data analysis plan, Statistical Procedures and Presentation of Findings

3.13.1 Data Entry and Cleaning Procedures

In this thesis data analysis was classified into four categories. First, socio

demographic data, this category consisted of explanatory predictor variables such as respondentôs gender, age, education level, religion affiliation, school location, school ownership, composition of school and residence of students (Appendix A). Second category, involved, items of perception variable predicted to determine adoption of preventive behaviours against HIV infection among secondary school students in Njombe region.

Third, category consisted of items of microsystem variable, predicted to determine on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Fourth category, contained items of exosystem variable that was predicted to determine on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Statistical Package Solution Service (SPSS) version 20 was used for data entry, analysis, statistical processing and presentation of findings into the contingency tables and graphs in chapter four in this report.

3.13.2 Data analysis and Statistical Procedures

This study used correlation and regression analysis statistical tests in the process of data analysis and examined status of the null hypotheses that guided analysis, interpretation, discussion and conclusion in this study. Statistical formula used depending on measurement scale used in data collection. In particular, this study used the following statistical tools: Pearson product moment correlation coefficient test *(r),* Spearman rank correlation coefficient test *(rho),* equation of regression line *(y = a + bx),* multivariate regression coefficient *(R),* multivariate logistic regression

coefficient analysis (R), and *t-test* as recommended by (Argyrous, 2005; Bluman, 1998; Cohen *et al.,* 2007; Elmes *et al.,* 2012; Greene *et al,* 2003; Miles, 2012). SPSS programme version 20 was used to analyse quantitative data.

In this study correlation, equation of regression line and multivariate regression coefficient statistical tests were preferred and used because such statistical tests enhanced to establish existence of relationship, direction, strength and closeness between independent variables such as perception, microsystem, exosystem variables and dependent variable such as process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The correlation and regression analysis statistical techniques are mostly used in social psychological studies. Also, correlation and regression coefficient analysis techniques are good to calculate, use and interpret the findings (Miles, 2012). Therefore, it was important to use correlation and regression coefficient statistical tests in this study. However, the investigator noted that, correlation relationship didnôt imply causation between independent and dependent variables as reported by (Best *et al.,* 2006; Cohen *et al.,* 2006; Elmes *et al.,* 2012; Miles *et al* ., 2012). Moreover, qualitative data was analyzed by using content analysis method guided by the qualitative research approach. Content analysis method involved systematic interview, synthesis, recording, interpretation and presentation of qualitative data such that responded well to the research specific objectives of the present study as documented by (Breakwell, 2012).

3.13.3 Presentation of Findings

This pertained, to extracting, structuring, synthesizing, organizing, and tabulation of findings into contingency tables, graphs and scatter plots. The findings of independent and dependent variables of this study were presented such that they responded to specific research objectives and research hypotheses of this report.

3.13.3.1 Contingency Tables

These tools enhanced presentation of large amount of findings such as socio demographic data, frequencies, percentages, correlation coefficients *(r*), regression coefficient *(R),* probability values, brief words such as titles and source of findings, as presented in chapter four in this report. Also, the contingency tables presented enough informative findings such that the reader could read, interpret and understand the findings quickly and correctly through visual clues. Again, contingency tables presented the findings in a simple way which was clear, precise, neat, accurate and informative such that the findings responded well to the specific research objectives and research hypotheses of this report. The presentation of findings in contingency tables was enhanced by the use of SPSS programme version 20 (Argyrous, 2005).

Similarly, contingency tables enhanced to use statistical tests to calculate the correlation coefficient *(r),*and*(rho),* equation of regression line *($y = a+bx$*), and, multiple correlation coefficient *(R)* Also, calculation of regression coefficient(R), multiple regression coefficient and multivariate logistic regression coefficient. Furthermore, the data findings were presented in contingency tables such that could facilitate statistical calculation and comparison of the correlation coefficients and regression coefficients analysis.

The tables were flexible such that could accommodate most types of empirical findings and brief words inform of tittles of the table, tittles of horizontal rows and vertical columns. Templates added quality of presentation of findings and enriched visually attractive images which enhanced effective communication of findings to the readers of this report. Also, contingency tableôs structure was moderated to cope with the needs of researchers and readers of the research findings of this report. Source of findings was presented at the bottom of the table while the title of the table at the top of the table, indicated the type of findings contained into the contingency table.

Similarly, contingency tables correctly presented findings, in effective way of organizing quantitative findings and communicated well the findings to the readers of this report. As a result of use of contingency tables, SPSS software enhanced to design, enters the findings into the templates and presented the findings such that correctly responded to specific research objectives and research hypotheses of this report. Lastly, contingency tables facilitated visual comparison of sets of numerical findings in terms of percentages as presented in chapter four in this report.

3.13.3.2 Histograms

The histogram involved graphs that displayed the findings by using vertical bar graphs of various heights to represent the percentages of the dependent variable. Width of the bar graph indicated the independent variables such as details of perception, microsystem and exosystems variables determined level of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In addition, histograms enhanced effective presentation of findings that was in form of frequencies and percentages in this report. The histogramôs height presented frequencies and percentages of the dependent variable that was amount of adoption of preventive behaviours against HIV infection among secondary schools in Njombe region. Height of the bars depicted variations of percentages of the level of adoption of preventive behaviours against HIV infection among secondary school student.

Width of the bar depicted variations of independent variables, the perception, and microsystem and exosystems variables determined process of adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania. Moreover, as reported by Denscombe (2005), histograms enhanced to convey the findings to the reader in pictorial forms. It facilitated the readers of this report to comprehend the meaning of findings presented graphically in the histograms in this report.

The histograms enhanced readerôs attention, interests and concentration to read and correctly understand the findings of this report. Also, the histograms facilitated the readers of this report to critically synthesize, compare and discover the trend and pattern variations of the findings depending upon particular independent variable. The histograms enhanced the readers of this report to determine the nature of skewness distribution of the findings of this study. Lastly, the histograms complimented with contingency tables and scatter plot graphs to present findings to the reader of this report, leading to quick and maximum understanding the perception, microsystem and exosystem independent variables determining adoption of preventive behaviours against HIV infection among secondary school students in

Njombe region.

3.13.3.3 Scatter Plots

These plots involved a graph of coordinated ordered pairs of quantitative data of independent variables presented in x-axis and dependent variable presented in y-axis. The independent variables were perception, microsystem, and exosystem variables determined adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania. Also, for convenience purpose, score of malesô respondents were designated as independent variables and was plotted along x- axis. The femalesô responses were designated as dependent variable and were plotted along y-axis. Thus, the coordinates of independent and dependent variables were plotted on scatter plot graphs in chapter four in this report. The scatter plot graphs were preferred and used to present findings in this report because such graphs enhanced the following factors:

The scatter plot enhanced use of visual method of examining the nature of the relationship between the independent variables and dependent variables. The scatter plot enhanced to read and quickly understood the coordinateôs findings between independent variables and the dependent variable. As a result, in this report, it was easier to understand and establish the direction of correlation coefficient *(r)* and regression coefficient*(R*) between independent variables and dependent variable.

Similarly, in this study, the scatter plot graph facilitated determination of nature of relationship between independent variables such as perception, microsystems, exosystems and dependent variables such as adoption of preventive behaviours

against HIV infection among secondary schools students in Njombe region. The nature of relationship could be positive linear relationship or negative linear relationship. Also, scatter plot graph enhanced determination of correlation coefficient (*r),* regression coefficient *(R),* significance of the relationship between independent variables and dependent variables and determination of regression line which facilitated to determine the direction of relationship between independent variables and dependent variable of this study.

Moreover, the scatter plot graph enhanced determination of strength of correlation coefficient or regression coefficient, depending upon closeness of scatter dots around the regression line. Close dots to the regression line indicated strong correlation coefficient or regression coefficient and vice versa. Also, the scatter plots facilitated determination of the equation of the regression line. This equation indicated the nature of the relationship, such as positive or negative, relationship between independent variables such as perception, microsystem and exosystem variables and dependent variable such as adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The next chapter presents data presentation, analysis and interpretation of findings of this report.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter presents the findings of the present study. The findings responded to the specific research objectives and the respective research hypotheses. The findings were presented into three main sections: First, the contribution of perception variable on adoption of preventive behaviours. Secondly, contribution of microsystem variable on adoption of preventive behaviours. Thirdly, contribution of exosystem variable on adoption of preventive behaviours. The Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988) guided the analysis, interpretation, presentation, and conclusion of the findings of this report.

4.2 Socio Demographic Characteristics of the Sample

The sample size of this study was 500 male respondents and 500 female respondents leading to a total of 1,000 respondents. The sample size of male and female respondents was purposefully determined. This sample composition ensured good gender balance of findings in this study. About 45% of the respondents were in the age of 15 to 18 years, while 55% respondents were in 19 to 23 years. The age of the respondents reflected the adolescents group in the general population. As such, the age group was likely to be a predictor variable related to peer group influence as reported by The Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988).

Similarly, educational level was used as a predictor variable related to knowledge ability of respondents of this study. Table 4.1 indicated that, in this study most

respondents had advanced secondary education knowledge (64%). This education predictor variable reflected that, in this study, findings were generated by informed respondents about psychosocial determinants on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. In the perspective of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988), a school is a strong microsystem component that can influence the behaviour of the individual.

Religion affiliation, was another predictor variable accommodated into the sample of this study. Table 4.1; indicate that, the sample accommodated Christians and Muslims believers. In the framework of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988) faith based institutions and believers are components of microsystems. These beliefs ecological systems strongly and directly influenced behaviours of individuals such as secondary school students, accommodated into the microsystems such as churches or mosques. Also, religion affiliation variable indicated that, in the present study findings were generated by religious committed respondents, capable of articulating their feelings about perception, microsystem and exosystem information about the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Such valid and reliable findings were generated from religious ethical respondents.

Likewise, school ownership, as a component of microsystem, was included in the sample of this study. The ownership variable was operationalized as either: public or private owned secondary schools. Approximately 72% (N=1,000) respondents were from public owned secondary schools, where as 28% respondents were from

private secondary schools including seminary secondary schools. Both public and private owned secondary schools were components of microsystems ecological level.

The type of school ownership directly influenced the nature of findings. Private secondary schools emphasized their leanerôs to seriously adhere to ethics and discipline behaviours in academic activities compared to students in public secondary schools. Consequently, private owned schools such as seminary schools had elevated participation rates (87.8% among Christians and 12.2% among Muslims) in the present study. Composition of the school was another predictor variable used in the study. Composition of school reflected the admission of either both gender or admission of single gender only, in a particular secondary school, captured the interaction among male and female secondary school students in Njombe region, Tanzania.

Lastly, residence of students was another variable incorporated into the sample of this study. The residence variable captured the settings in which the respondents were hosted. Residences were operationalized as boarding and day school or day school only. Table 4.1 indicated that 89% (N=1000) students were studying in boarding and day schools while 11% students were hosted in day schools. Thus, in the context of Bronfenbrennerôs Ecological System Theory (Bronfenbrenner, 1988) most findings of this study, on psychosocial determinants of the adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, was obtained in the framework of boarding and day school residence of respondents. The demographic data were captured as they

facilitated to understand the quality of respondents and findings of this report. Therefore, this comprehensive and heterogeneous composition of the sample adequately ensured strong validity and reliability findings of this study. More details with regard to characteristics of the sample for this report are presented in Table 4.1 in this report.

Table 4.1: Socio Demographic Characteristics of the Sample by Gender (N=1000)

Variables.	Males n1=500		Females n2=500		Total N=1000	
	n	%	n	%	N	%
Age group in years: 15-18	185	37	261	52.2	446	44.6
19-23	315	63	239	47.8	554	55.4
Education level:						
Ordinary Secondary education (Form I-IV)	175	35	182	36.4	357	35.7
Advanced secondary education (Form V-VI	325	65	318	63.6	643	64.3
Religion affiliation: Christian	449	89.8	429	85.8	878	87.8
Muslim	51	10.2	71	14.2	122	12.2
School location: Rural	381	76.2	341	68.2	722	72.2
Urban	119	23.8	159	31.8	278	27.8
School ownership: Public	324	64.8	392	78.4	716	71.6
Private	176	35.2	108	21.6	284	28.4
composition of school : Co-education	305	61.0	483	96.6	788	78.8
Boys or Girls school only	195	39.0	17	3.4	212	21.2
Residences of students: Boarding and day school	445	89.0	442	88.4	887	88.7
Day school	55	11.0	58	11.6	113	11.3

Source: Field work survey.

4.3 Findings

4.3.1 The Contribution of Perception Variable on Adoption of Preventive Behaviours

This study examined, if there was no statistically significant relationship between perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The study tested and

analyzed the determinant variables that constituted the predicted items of perception variable. Table 4.2, presents the items of perception variable that were predicted and tested as determinants of preventive behaviours against HIV infection among secondary school students.

Table 4.2: Reported Contribution of Perception Variable, by Gender (N=1000)

Items of Perception variable	**Males' responses n_1= 500**		**Females' responses n_2 = 500**		**Total responses (N=1000)**	
Students perception of:	**n**	**%**	**n**	**%**	**n**	**%**
Credibility of preventive knowledge against HIV infection among students.	113	22.6	102	20.4	215	21.5
Susceptibility to HIV infection among students.	74	14.8	55	11	129	12.9
Primacy effects of knowledge delivered to empower students to adopt preventive behaviours.	53	10.6	59	11.8	112	11.2
Benefits of preventive behaviours against HIV infection among students.	52	10.4	49	9.8	101	10.1
Life skills learning service to empower students to adopt preventive behaviours against HIV.	51	10.2	49	9.8	100	10.0
Self ï efficacy expectancies to preventive behaviours against HIV infection to students	36	7.2	44	8.8	80	8.0
Controllability of preventive behaviours against HIV infection among students	36	7.2	33	6.6	69	6.9
Persuasibility to adopt preventive behaviours against HIV infection among students	30	6.0	37	7.4	67	6.7
Acceptability of preventive behaviours against HIV infection among students	29	5.8	35	7.0	64	6.4
Invulnerability to HIV infection risk among secondary school students.	26	5.2	37	7.4	63	6.3

r = 0.95, DF=8, P< 0.05, two tailed test
Source: Field work survey.

The findings in Table 4.2 indicate that, items of perception variable such as credibility of preventive knowledge, susceptibility to HIV infection among students, primacy effects of knowledge delivered to empower students to adopt preventive behaviours and benefits of preventive behaviours, were reported by respondents as

the most significant items of perception variable determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania (*r=0.95, df = 8, p < 0.05, two tailed test).* The null hypothesis was rejected. .Hence; the first alternative hypothesis was accepted that, there is a statistically significant relationship between perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Similarly, to improve understanding about this finding, more elaborations was provided in Figure 4.1 in the histogram presenting specific items of perception variable determined adoption of preventive behaviours such as use of VCT services against HIV infection among secondary school students in Njombe region, Tanzania. Likewise, in Figure 4.1 the histogram indicated the findings that suggested the type and nature of distribution of perception variable that determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. In Figure 4.1, the horizontal X-axis, presented items of independent variable and vertical Y-axis, presented performance of dependent variable .The findings were presented in form of percentages.

Figure 4.1 indicates the pattern of the findings about items of perception variable determined on adoption of preventive behaviours against HIV infection among secondary schools students. The histograms suggested that all predicted items influenced the adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. However, in Figure 4.1, the findings suggested that, credibility of preventive knowledge against HIV infection most

determined the adoption of preventive behaviours against HIV infection in schoolsô microsystems.

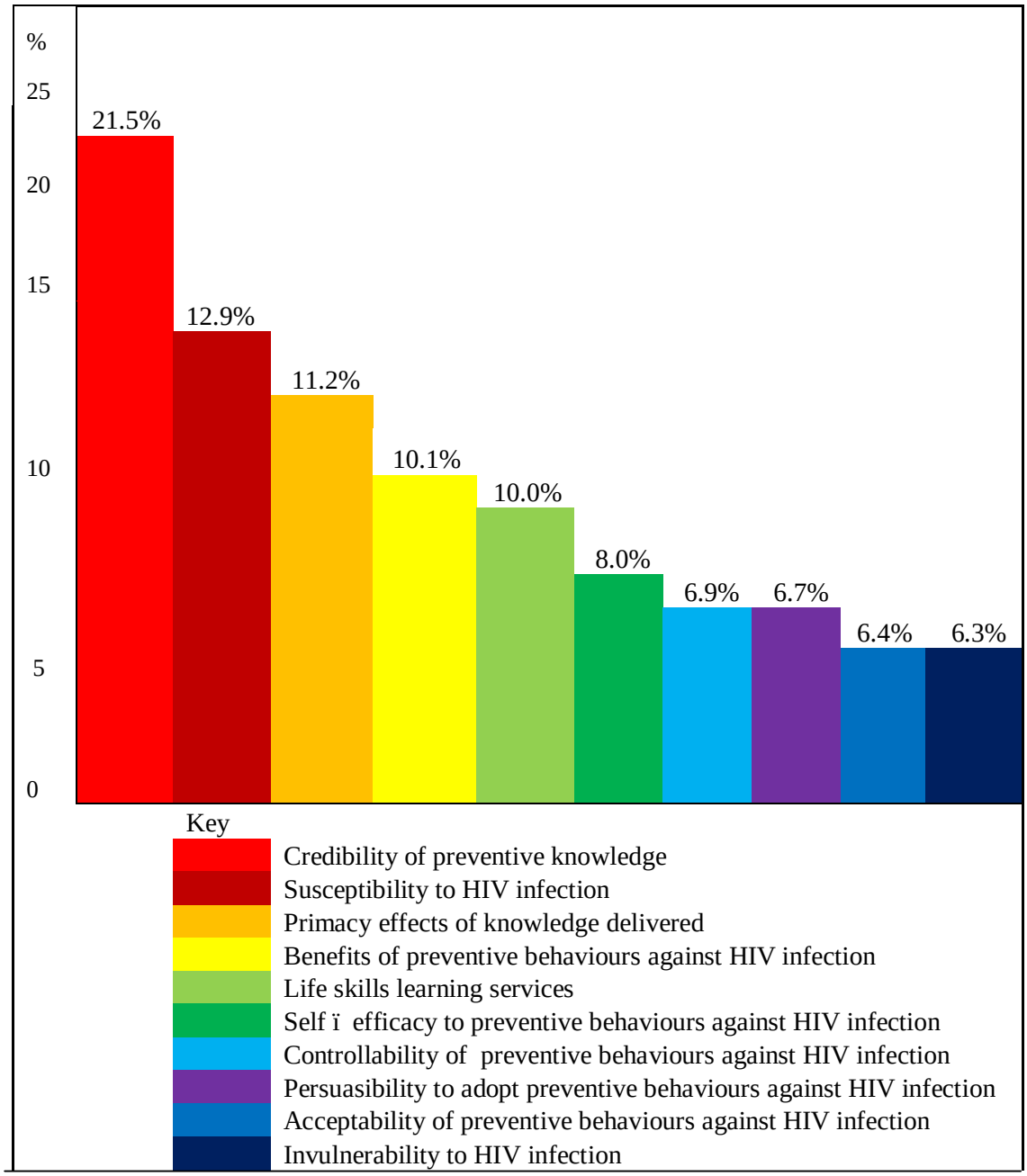

Figure 4.1: Histogram Presenting Items of Perception Variable Determined Adoption of Preventive Behaviours against HIV Infection

This finding suggested that, credibility of the preventive knowledge enhanced trust, acceptability and likeability of the preventive knowledge. As a result, credibility of Preventive knowledge most influenced the adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. In addition, other items of perception variable that most determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region included: Susceptibility to HIV infection among students and primacy effects of knowledge delivered to empower students to adopt preventive behaviours against HIV infection.

Furthermore, the findings for all items in Table 4.2 were subjected to statistical analysis, Pearson product moment correlation coefficient test was used to calculate the correlation coefficient for all items *(r=0.95*). This coefficient was used to establish the nature of relationship between items of perception variable (independent variable) and dependent variable such as adoption of preventive behaviours against HIV infection among secondary school students in Njombe region.

The numerical values required to operate the formula leading to the determination of correlation coefficient*(r*) was calculated from Table 4.2 in this report. Substuting in the formula and solve for *(r),* one obtain *(r=0.95*). Also, statistical calculations in Table 4.2 indicated the correlation coefficient of items of perception variable was (*r = 0.95, df = 8, p< 0.05, at two tailed test*). This coefficient suggested rejection of the null hypothesis. As a result the same correlation coefficient suggested acceptance of the alternative hypothesis.

Thus, the findings indicated that, there were positive, linear and statistical significant relationship between perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania (*r = 0.95, df = 8, p< 0.05, two tailed test*). Using Pearson product moment correlation coefficient test, these findings suggested that, there were less than 5 % chances that random error could account for the outcome results of this study. Thus, these findings ought to be of acceptable significant quality. Pearson product moment correlation coefficient test was opted because it facilitated to quantify strength and direction of relationship between the independent variables and dependent variable. In this study Pearson (*r =0.95*), indicated existence of strong and positive linear relationship between items of perception variable and process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In addition, in this report the significance of correlation coefficient (r =0.95) was examined and verified by using the t-test formula.

Substituting into t-test formula and solve for (t), one gets:

$$t = 0.95.\sqrt{\frac{10-2}{1-(0.95)^2}}$$

$$= \mathbf{8.605}$$

This finding suggested rejection of null hypothesis, since the tested value fall into the critical rejection region. Therefore, the alternative hypothesis was accepted, that, there were statistically significant relationship between perception variable and

adoption of preventive behaviours against HIV infection among secondary school students in Njombe region (*t(8) = 8.605, p< 0.05, two tailed test*). Also, using t-test, the findings suggested that, there were less than 5% chances that random error could account for the findings of this study. Thus, the finding of this study was of acceptable quality, valid and reliable. That*, t-test* was opted and used in data analysis for this study because it was recommended for examining the statistical significance of the correlation coefficient *(r)* as documented by Bluman (1998).

In addition, in this report, the findings of items of perception variable, Table 4.2, were subjected to the linear regression analysis. The equation of the regression line, Y= a+ bx, was used to analyse the findings. The values needed for calculation of the equation was calculated from Table 4.2. Substituting into the formula and solve for *"a"* and *"b"* one obtain a = 13.654; b = 0.727.

Hence, the equation of the regression line, y = a+ bx, was*: y = 13.654 + 0.727x*.

Moreover, the equation of the regression line, suggested positive regression coefficient (*y= 13.654 + 0.727x*). In the context of this study, the equation of regression line indicated that, there was positive significant linear relationship between items of perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Also, the findings suggested that, as items of perception variable such as credibility of preventive knowledge against HIV infection, increased, simultaneously the adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, increased too and vice versa.

In addition, to enhance quality understanding of the findings among readers of this report, the research results on perception variable determined adoption of preventive behaviours against HIV infection among secondary school students in Njombe region were analysed and presented into the scatter plot graph and equation of regression line as provided in Figure 4.2, in this report.

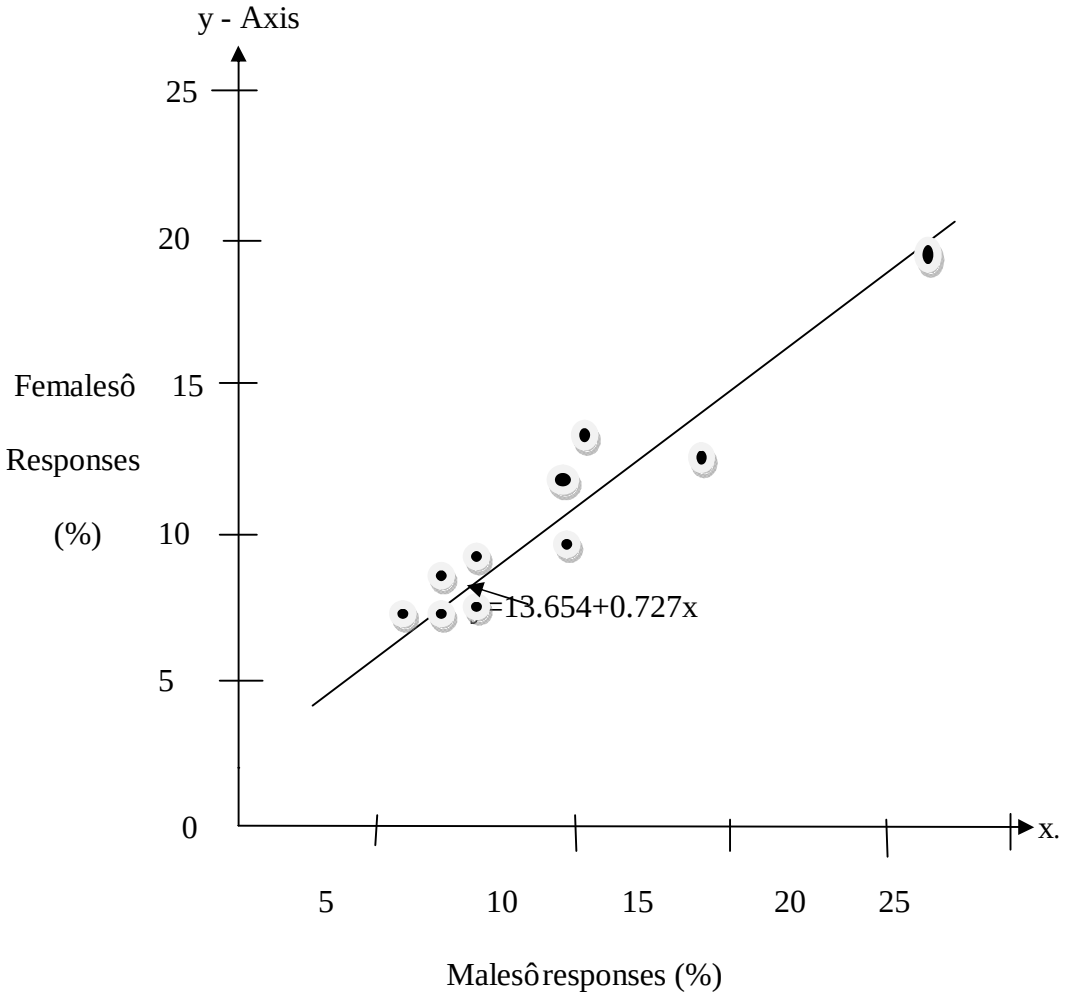

Figure 4.2: Scatter Plot Graph, Equation and Regression line Presenting Perception Variable Determined on Adoption of Preventive Behaviours Against HIV Infection

The scatter plot graph, equation and regression line in Figure 4.2 indicated positive direction and linear, relationship between independent variable and dependent variable. In Figure 4.2, the independent variable was perception variable and

dependent variable was adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Similarly, the regression line sloped upwards from left to right and indicated positive linear relationship between items of perception variable and adoption of preventive behaviours against HIV infection among secondary school students. This finding suggested that, increase of items of perception variable such as susceptibility to HIV infection among students, simultaneously, lead to increase adoption of preventive behaviours such as use of VCT services, against HIV infection among secondary school students in Njombe region.

The doted points indicated the coordinates of findings of malesô and femalesô responses. However, the doted points tended to cluster around the regression line and indicated an image of linear relationship in positive direction. These findings suggested statistical significant relationship between perception variable and process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. The close clustering of doted points around the regression line was supported by a significant, positive, correlation coefficient ($r= 0.95$) which was close to positive one.

Also, supported by positive, regression coefficient presented in the equation of regression line ($y= 13.654 + 0.727x$), these coefficients suggested existence of positive direction of correlation and linear relationship between perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Therefore, in the framework of this

report, the scatter plot graph, equation and the regression line presented in Figure 4.2 suggested that, there was a significant, positive correlation coefficient and linear relationship between perception variable and process on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In addition, Appendix C, indicated reported additional items of perception variable determined on adoption of preventive behaviour such as avoiding alcoholism, against HIV infection among secondary school students in Njombe region. The items included the use of logical argument in counselling and delivering message on preventive behaviour against HIV infection. This finding was found to be statistically significant and in positive direction relationship *(rho= 0.90, df= 5, p = 0.001, two tailed test*). This finding implied that, logical argument items was important in facilitating effective counselling leading to increased process on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region and vice versa.

In addition, systematic repetition rate of counselling and receiving preventive message against HIV infection was statistically accepted as determinant variable on adoption of preventive behaviour in secondary schools in Njombe region (Appendix C). This finding was statistically significant and in positive direction (*rho=0.81, df= 5, p = 0.000, two tailed test*). This finding implied that, counselling services ought to be delivered several sessions and systematically to enhance effective adoption of preventive behaviour against HIV infection among secondary school students in Njombe region, Tanzania. Similarly, reliable quality information on preventive

behaviours against HIV infection among secondary school students, was accepted as a significant determinant variable as presented in (Appendix C). This finding indicated need of consistence of information delivered to students on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. This finding was found to be statistically significant and in positive direction of relationship *(rho = 0.94, df = 5, p= 0.000 at two tailed test*).

Likewise, validity of information on delivering preventive behaviours against HIV infection among secondary school students in Njombe region was accepted as significant determinant variable, as presented in (Appendix C). This finding implied that, information delivered to student about preventive behaviours against HIV infection ought to be correct to enhance the students adopt the preventive behaviours against HIV infection in secondary school settings in Njombe region. This finding was found to be statistically significant, in positive direction of relationship *(rho = 0.89, df = 5, p = 0.002, at 0.05, two tailed test).* Using Spearman rank correlation coefficient test *(rho*), this finding suggested that, there was less than 5% chances that random error could account for the findings of this study. Therefore, these findings were of acceptable quality, valid and reliable.

4.3.2 The Contribution of Microsystem Variable on Adoption of Preventive Behaviours

The second hypothesis in this study examined, whether, there was no statistically significant relationship between microsystem variable and process on adoption of preventive behaviour against HIV infection among secondary school students in Njombe region, Tanzania. Table 4.3, presents the items of microsystem variable

that were predicted and tested as determinants on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Table 4.3: Reported Contribution of Microsystem Variable, by Gender (N=1000)

Items of Microsystem variable	Males' responses n_1= 500		Females' responses n_2 = 500		Total responses (N=1000)	
Students receiving:	n	%	n	%	n	%
Social supportive socialization in school systems	84	16.8	59	11.8	143	14.3
Social supportive socialization in church /mosque systems	69	13.8	64	12.8	133	13.3
Social supportive socialization in family systems	61	12.2	62	12.4	123	12.3
Social supportive counselling in health care systems	46	9.2	77	15.4	123	12.3
Social supportive socialization in peer group systems	32	6.4	68	13.6	100	10.0
Counselling supervision services	50	10	39	7.8	89	8.9
Search for self identity influence adoption of preventive behaviours	51	10.2	36	7.2	87	8.7
Traditional healers influence adoption of preventive behaviours	41	8.2	40	8.0	81	8.1
Structure of nuclear family influence adoption of preventive behaviours	39	7.8	29	5.8	68	6.8
Adherence to code of ethics for counselling services	27	5.4	26	5.2	53	5.3

r = 0.82, df =8,p < 0.05,at two tailed test

Source: Field work survey.

The findings in Table 4.3, indicated that items of microsystem variable such as receiving social supportive socialization in schools systems ,receiving social supportive socialization in church or mosque systems, receiving social supportive socialization in family systems, and receiving social supportive counselling in health care systems, were reported by most respondents as significant items of microsystem variable determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania (*r= 0.82, df=8, p<*

0.05, two tailed test).

The null hypothesis was rejected. Thus, the alternative hypothesis was accepted that, there is a statistically significant relationship between microsystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. To increase understanding about the results of this study, more elaboration were presented in Figure 4.3 in the histogram. This graph presented specific items of microsystem variable determined on adoption of preventive behaviours such as avoiding alcoholism, against HIV infection among secondary school students in Njombe region, Tanzania. Figure 4.3 presented findings about items of microsystem variable predicted to determine on adoption of preventive behaviour against HIV infection among secondary school students in Njombe region, Tanzania.

Figure 4.3 indicated the leading items of microsystem variable, that most determined adoption of preventive behaviours against HIV infection in secondary schools in Njombe region included the following: Receiving social supportive socialization in schools. This finding suggested that, school systems have structured communication network, authentic power, good role model performed by teachers and ethical behaviours. Thus, these potentials empower the school as socialization agent to determine the adoption of preventive behaviours against HIV infection among secondary schools students.

Similarly, other leading and main items of microsystem variable as presented in Figure 4.3 were: receiving social supportive socialization in Church/Mosque;

receiving social supportive socialization in family systems and receiving social supportive counselling in health care systems.

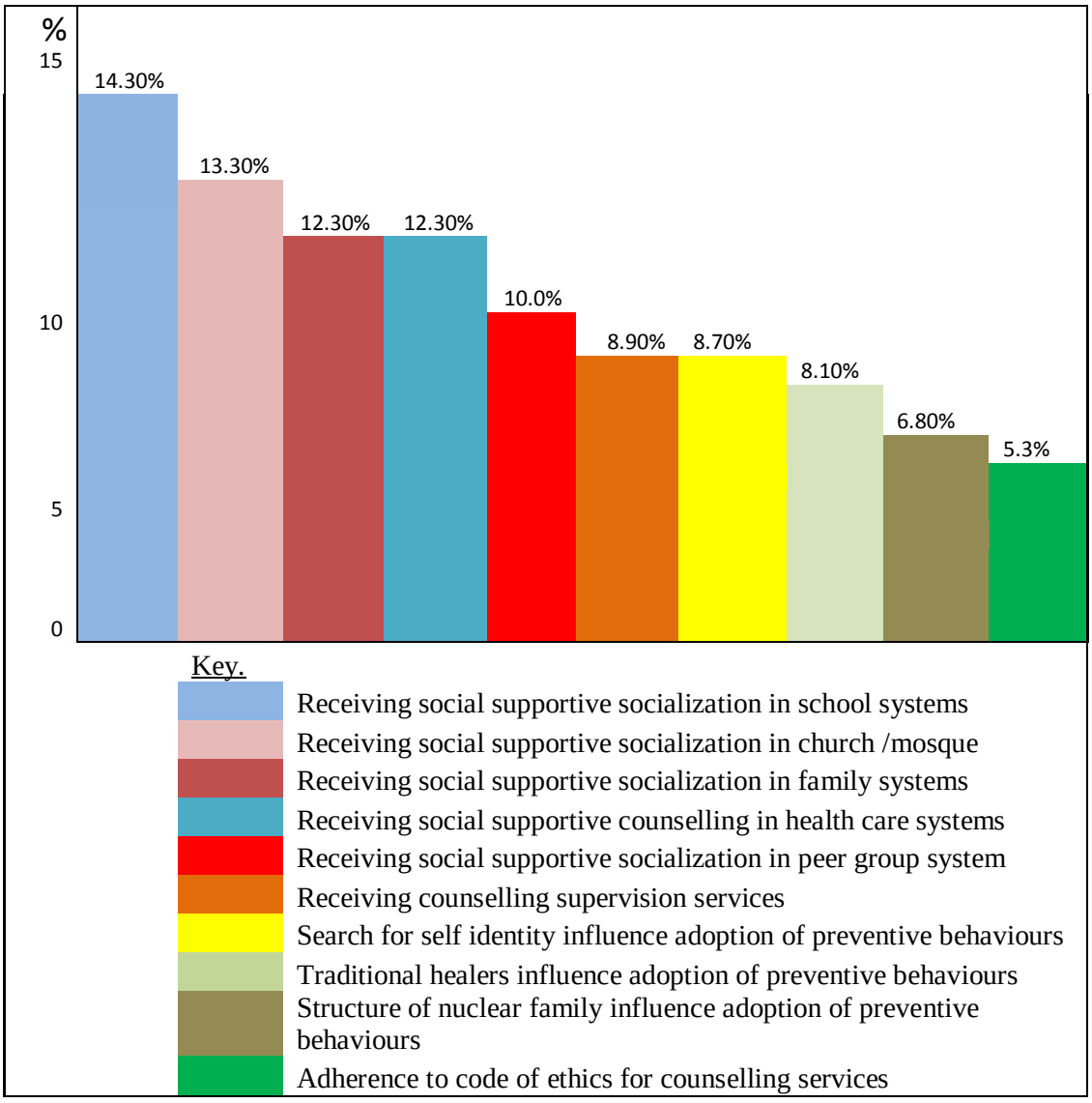

Figure 4.3: Histogram Presenting Items of Microsystem Variable Determined on Adoption of Preventive Behaviours against HIV infection

The results in Table 4.3 were subjected to statistical analysis. Pearson product moment correlation coefficient test was deployed to calculate the correlation coefficient for all items (*r =0.82)* which was verified its significance by using *t-test*. The coefficient *(r.)* was used to establish the status of magnitude and direction of

relationship between the independent variable such as items of microsystem and dependent variable that is, process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The numerical values required to operate the formula leading to correlation coefficient (*r*.) was calculated from Table 4.3, in this report.

Substituting into the formula and solve for (r) one get *Pearson r = 0.82.*

Statistical calculations in Table 4.3 indicated that, the correlation coefficient of items of microsystem variable was (*r = 0.82, df = 8, p< 0.05, at two tailed test*), level of significance. This correlation coefficient suggested rejection of the null hypothesis. Consequently, the same correlation coefficient *(r=0.82*) indicated acceptance of the alternative hypothesis for this study. Therefore, these findings verified that, there was statistically significant and positive relationship between microsystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania *(r=0.82, df= 8, p< 0.05, two tailed test*). Using Pearson product moment correlation coefficient test, these findings suggested that, there were less than 5% chances that random error could account for the outcome findings of this study. Hence, these findings were accepted as of significant quality, valid and reliable out come.

In addition, in this report, the significance of the correlation coefficient *(r=0.82*) was verified by Using the t-test formula.

Substituting into the t-test formula and solve for (t), one gets:

$$t = 0.82. \sqrt{\frac{10-2}{1-(0.82)^2}}$$

$$= \mathbf{4.052.}$$

This result suggested rejecting the null hypothesis, since the tested (*t)* value fall into the critical rejection region. Hence, the alternative hypothesis was accepted in this study, that, there were statistically significant relationship between microsystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania *(t (8) = 4.052, p.<. 0.05, two tailed test).* Also, using (*t* test) the findings suggested that, there were less than 5% chances that random error could account for the results of this report. Therefore, the results of this study were of acceptable quality, valid and reliable out come. Hence, these results indicated that, there was statistically significant relationship between microsystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Moreover, the findings presented in this report were subjected to the linear regression analysis, so that the scores could be examined in details. The equation of the regression line was used to analyse the quality of the findings. The equation used was*: y= a + bx.* The numerical values required for the calculation of the equation of regression line, was calculated from Table 4.3 in this chapter. Substituting into the formula and solve for *"a"* and ñ*b*ò one get: a= 29.133; b=0. 417. The equation of the regression line*, y= a + bx was: y= 29.133 + 0.417x.* The equation of the regression line indicated existence of positive regression coefficient *(y=29.133+ 0.417x*).

In the framework of the present study, the equation of the regression line indicated that, there was a positive statistically significant association between microsystem variable and adoption of preventive behaviours against HIV infection among

secondary school students in Njombe region. Also, this result indicated that, as items of microsystem variable such as, receiving social supportive socialization in schools systems, increased, the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, increased and vice versa. Again, in the perspective of this report, the equation and regression line, suggested that, increase of microsystem variable, such as receiving social supportive socialization services in faith based institutions that is Church/Mosque or Temple, simultaneously, trigger increases of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

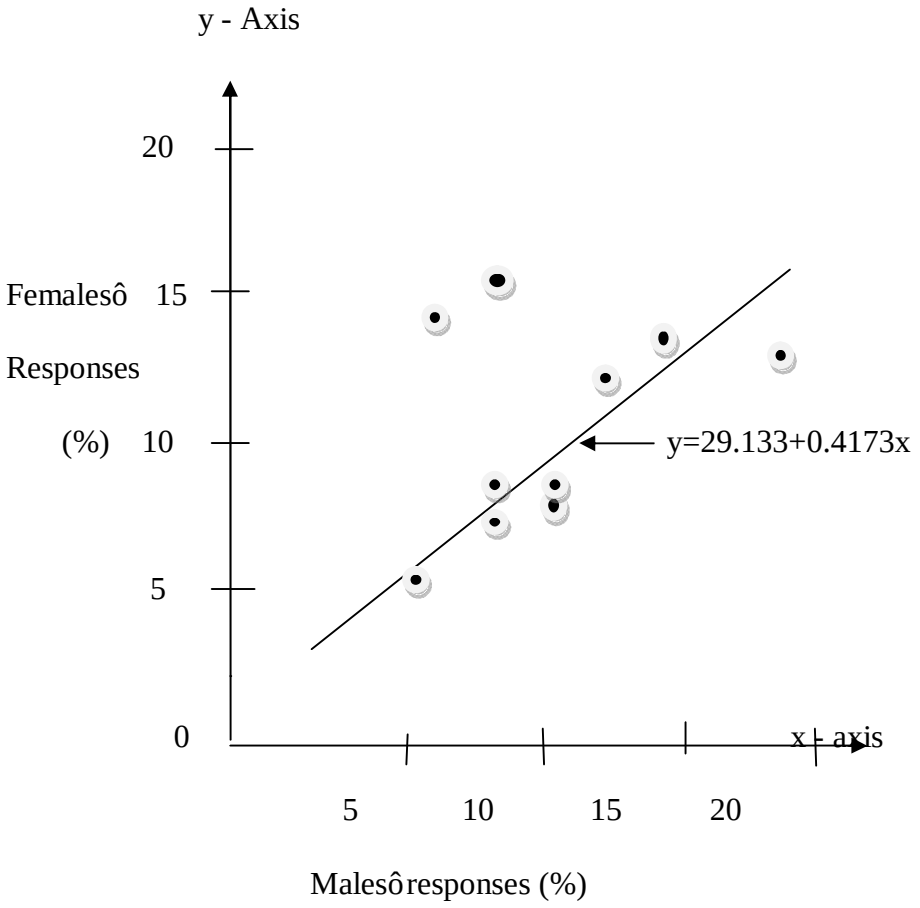

Figure 4.4: Scatter Plot Graph, Equation and Regression Line Presenting Microsystem Variables Determined on Adoption of Preventive Behaviours against HIV Infection

Similarly, to facilitate understanding of the findings among readers of this report, the research results on microsystem variable determined on adoption of preventive behaviour against HIV infection among secondary school students in Njombe region, were presented into the scatter plot graph and equation of the regression line as provided in Figure 4.4. The scatter plot graph, equation and regression line presented in Figure 4.4, indicated existence of linear and positive direction of association between independent variable that is microsystem and dependent variable such as adoption of preventive behaviours against HIV infection among secondary school students in Njombe region.

The regression line sloped upwards from left to right and suggested presence of strong positive relationship between microsystem variable, such as socialization in Church or Mosque faith based organization and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. This finding indicated that, increased microsystem variable that is receiving social supportive socialization in school systems, simultaneously, triggered increased process of adoption of preventive behaviours against HIV infection among students in schools and vice versa.

Moreover, in Figure 4.4, findings indicated that, the scattered dots tended to cluster along the straight equation regression line. The clustering of dots around the regression line, suggested presence of strong correlation coefficient ($r= 0.82$) which was very close to positive one. Also, the clustering of dots close to regression line was supported by the positive regression coefficients presented in equation of regression line ($y= 29.133+ 0.417x$). Thus, this regression coefficient suggested

existence of linear positive correlation and association between independent variable such as microsystem variable and dependent variable such as adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The regression line enhanced to make prediction of the dependent variable when independent variable was known. In the context of this study significance of independent variable such as microsystem variable enhanced and justified prediction of factors determined adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Therefore, these findings suggested that, the predicted microsystem variable significantly determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Similarly, as presented in (Appendix D) indicated reported additional items of microsystem variable, determined process on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The items of microsystem were as follows: Structure of extended family influenced the process of adoption of preventive behaviours against HIV infection in secondary schools. This finding was found to be statistically significant and was in positive direction relationship (*rho = 0.91, df= 5, p = 0.003, at two tailed test).*

This finding implied that, traditionally in Njombe region, preventive behaviours against HIV infection particularly sexuality matters were delivered to the youth by extended family members such as grandmothers, grand fathers, aunts and uncles.

However, due to modernization process, extended family members have little opportunity to provide reproductive health, counselling and socialization process to their youth who are in secondary schools. As a result; secondary school students insufficiently adopt preventive behaviours against HIV infection in secondary schools as well as at family level, in Njombe region, Tanzania.

Moreover, diversity networking between secondary school and family influenced adoption of preventive behaviour against HIV infection among secondary school students in Njombe region (Appendix, D**).** This finding was found to be statistically significant, in positive direction of relationship *(rho = 0.85, df= 5, p = 0.001, at two tailed test*). This finding indicated that, close relationship between school and family accelerated the rate of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region and vice versa. Thus, in the context of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988; Lewis *et al.,* 2003), at mesosystems level, schools and family should cooperate to enhance the secondary school students to increase rate of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region.

In addition, diversity of networking between school and health care system influence the rate of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region (Appendix, D). This finding was found to be statistically significant and was in positive, linear direction of relationship *(rho = 0.82, df= 5, p = 0.033, at two tailed test*). This finding indicated that, teachers and students in secondary schools ought to cooperate with health expertise to enhance

understanding and increased process of adoption of preventive behaviour against HIV infection in secondary school systems. Also, this finding indicated that close cooperation between schools and health care systems increased rate of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region and vice versa (Appendix, D).

Similarly, religiosity faith was found to be a significant determinant variable that influenced level of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. This finding indicated existence of statistically strong, significant, positive direction and linear relationship between microsystem variable and adoption of preventive behaviour against HIV infection among secondary school students in Njombe region *(rho = 0.78, df= 5, p = 0.004, at two tailed test).* Also, this finding implied that high religiosity belief, increased process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Also, according to Spearman rank correlation coefficient test, *(rho*) the findings of this study suggested that there was less than five percent (5%) chances that random error could account for these findings of this study. Therefore, this finding was of acceptable quality as valid and reliable information findings. Details of findings captured by summative rating Likert scale that presents items of microsystem variable determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, were presented in (Appendix D).

4.3.3 The Contribution of Exosystem Variable on Adoption of Preventive Behaviours

The third hypothesis in this study examined, whether there was no statistically significant relationship between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania**.** Specifically, this study examined determinants constituted items of exosystem variable, predicted to determine on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Table 4.4: Reported Contribution of Exosystem Variable, by Gender (N=1000)

Items of Exosystem variable	**Males' responses n_1= 500**		**Females' responses n_2 = 500**		**Total responses (N=1000)**	
Students accessibility to:	**n**	**%**	**n**	**%**	**n**	**%**
Televisionôs messages influence adoption of preventive behaviours	102	20.4	71	14.2	173	17.3
Print mediaôs messages influence adoption of preventive behaviours	65	13	77	15.4	142	14.2
Radioôs messages influence adoption of preventive behaviours	50	10	74	14.8	124	12.4
Using academic debates for advocating adoption of preventive behaviours	64	12.8	47	9.4	111	11.1
Internetôs messages influence adoption of preventive behaviours	62	12.4	48	9.6	110	11.0
Using drama to advocate and communicate messages for adoption of preventive behaviours	52	10.4	50	10	102	10.2
Compliancebility to policy that enhance adoption of preventive behaviours	34	6.8	47	9.4	81	8.1
Promoting responsive legal service changes in schools influence the adoption of preventive behaviours	23	4.6	33	6.6	56	5.6
Promoting responsive systems change in schools influence adoption of preventive behaviours	25	5.0	30	6.0	55	5.5
Fostering responsive systems changes in families influence adoption of preventive behaviours	23	4.6	23	4.6	46	4.6

r = 0.75, df =8, p, < 0.05, two tailed test

Source: Field work survey.

Table 4.4 presents items of exosystem variable that were predicted and tested as determinants on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. These items were subjected to statistical test, to examine the significant status of the third, null hypothesis of this study. The findings in Table 4.4 indicated that, items of exosystem variable such as accessibility to television, print media and radioôs message were reported by most respondents as the most exosystem variables determined adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania *(r= 0.75, df = 8,p < 0.05, two tailed test*). The null hypothesis was rejected. Thus, third alternative hypothesis was accepted that, there is a statistically significant relationship between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania

Moreover, to facilitate easy understanding of the research findings on items of exosystem variable that determine adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, the findings was presented into the Histogram graph in Figure 4.5. It indicats pattern of the findings about the items of exosystem variable determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Also, Figure 4.5 suggested variations of strength in percentages about items of exosystem variable determining on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

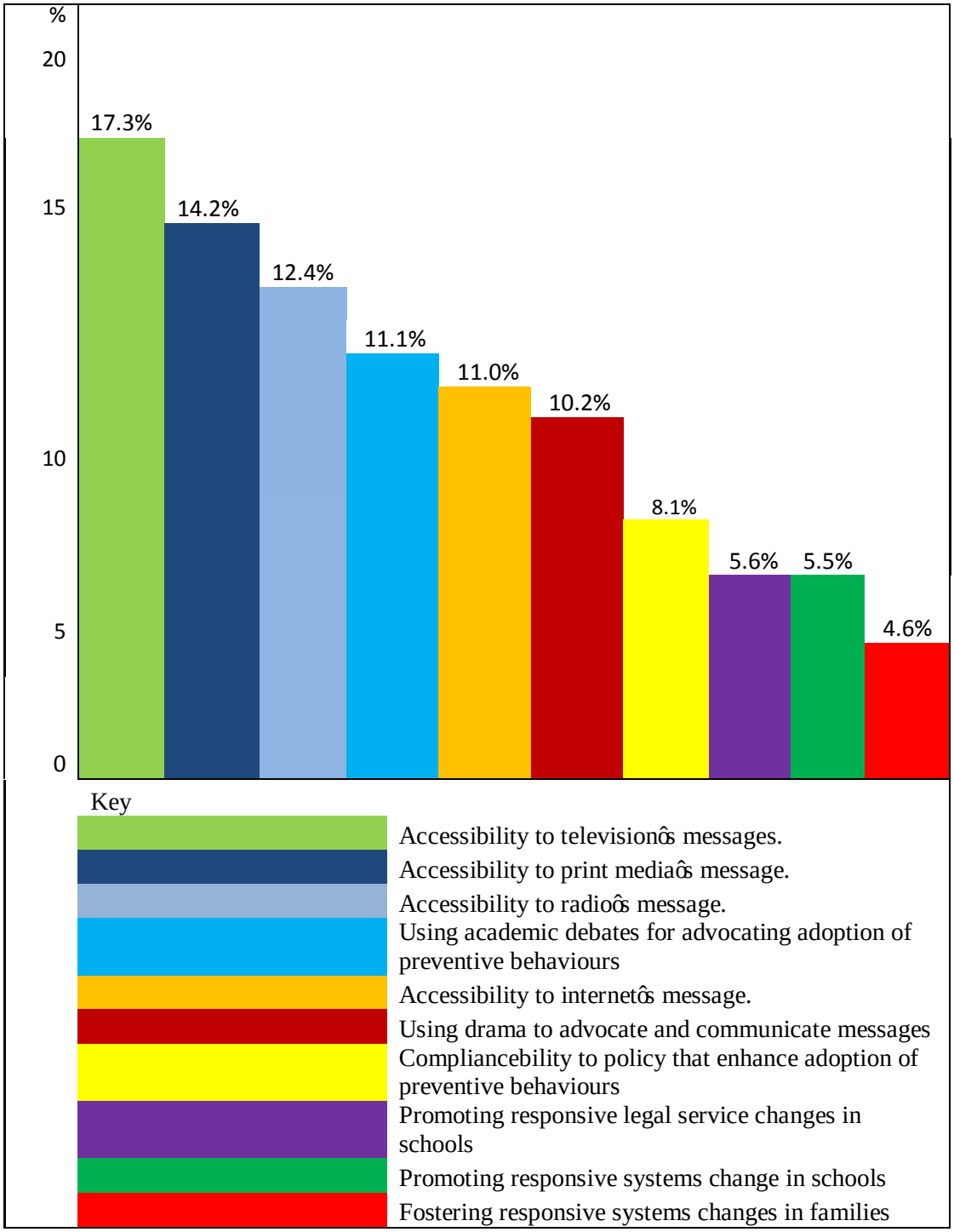

Figure 4.5: Histogram Presenting Items of Exosystem Variable Determined Adoption of Preventive Behaviours against HIV Infection

Again, Figure 4.5 suggested that, accessibility to televisionôs message is the strongest item of exosystem variable that determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe

region. These findings indicated that, increase of accessibility to televisionôs message, simultaneously, lead to increase on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Also, the findings suggested that, television electronic media is very powerful to transmit its message, use actualities, attractive sounds and image pictures. As a result, television can trigger persuasion to the students to adopt preventive behaviours against HIV infection at higher percentages in secondary school settings in Njombe region, Tanzania.

In addition, other items of exosystem variable that scored more percentages and suggested being most determinant variables included the following: Accessibility to print mediaôs message influenced adoption of preventive behaviours against HIV infection. Another significant variable was accessibility to radioôs message influenced adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In Figure 4.5 the results suggested that, there was significant positive relationship between items of exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. That, increase of items of exosystem variable such as accessibility to televisionôs message, simultaneously triggered increase of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region and vice versa. These findings indicated that items of exosystem variable are significant factors in the process of struggling to combat HIV infection among students in secondary school settings in Njombe region, Tanzania.

In addition, the finding in Table 4.4 was subjected to statistical test analysis to enhance more understanding about the results among readers of this report. Pearson product moment correlation coefficient test was run to calculate the correlation coefficient (*r*). The coefficient enhanced to establish the association between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe, region, Tanzania.

The numerical values required in the formula for calculation of the correlation coefficient *(Pearson r.)* were calculated from Table 4.4, in this report. Substituting into the formula and solve for *(Pearson r)* one obtain *(r = 0.75*).Thus, Table 4.4 indicated that, the correlation coefficient was found to be *(r = 0.75, df = 8, p < 0.05, two tailed test)*. This correlation coefficient suggested rejection of the third null hypothesis. Consequently, the same correlation coefficient (*r= 0.75*) suggested acceptance of the alternative hypothesis for this study.

Thus, the findings in this study indicated that there was a statistically significant, positive, linear relationship between exosystems variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania *(r = 0.75, df= 8, p < 0.05, two tailed test).* Using Pearson product moment correlation coefficient test, these findings indicated that, there was less than 5% probabilities that random error could account for the outcome findings of this study. Hence, these findings were accepted as of significant valid and reliable information results.

Similarly, in this report, the significance of the correlation coefficient (*r*) was verified by using *t*he *t-test* formula.

Substituting into the *t-test* formula and solve for (*t*), one gets:

$$t = 0.75 \sqrt{\frac{10-2}{1-(0.75)^2}}$$

$$= \mathbf{3.207}$$

The finding suggested rejecting the null hypothesis, since the tested (t) value fall into the critical rejection region. Therefore, the third alternative hypothesis was accepted in this study, that, there was statistically significant relationship between exosystem variables and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region *(t (8) = 3.207, p <. 0.05, two tailed test).* Also, using *t-test*, the results indicated that, there were less than 5% chances that random error could account for the findings of this study. Thus, the results of this study were of acceptable quality, validity and reliability.

In addition to facilitate better understanding the findings was subjected to the linear regression analysis. The findings were subjected to the equation of the regression line*, y =a+ bx.*

The numerical values required for the calculation of the equation of regression line, was calculated from Table 4.4. Substituting into the formula and solve for ñaò and ñbò one gets: *a*= 21.784; *b* = 0. 564.

Hence, the equation of the regression line, y = *a + bx, was: y= 21.784 + 0.564x.*

The equation of the regression line suggested existence of positive regression coefficient *(y = 21.784+ 0.564x*). In the perspective of this report, the equation of the regression line implied that, there was positive, statistically significant, linear relationship between exosystem variables and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Also, the

findings in this study suggested that, as items of exosystem variable such as, accessibility to televisionôs message, increased, simultaneously, the adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, increased too and vice versa.

Also, to enhance understanding of the research findings on predicted items of exosystem variable determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, the findings was presented into the scatter plot graph, equation and regression line (Figure 4.6).

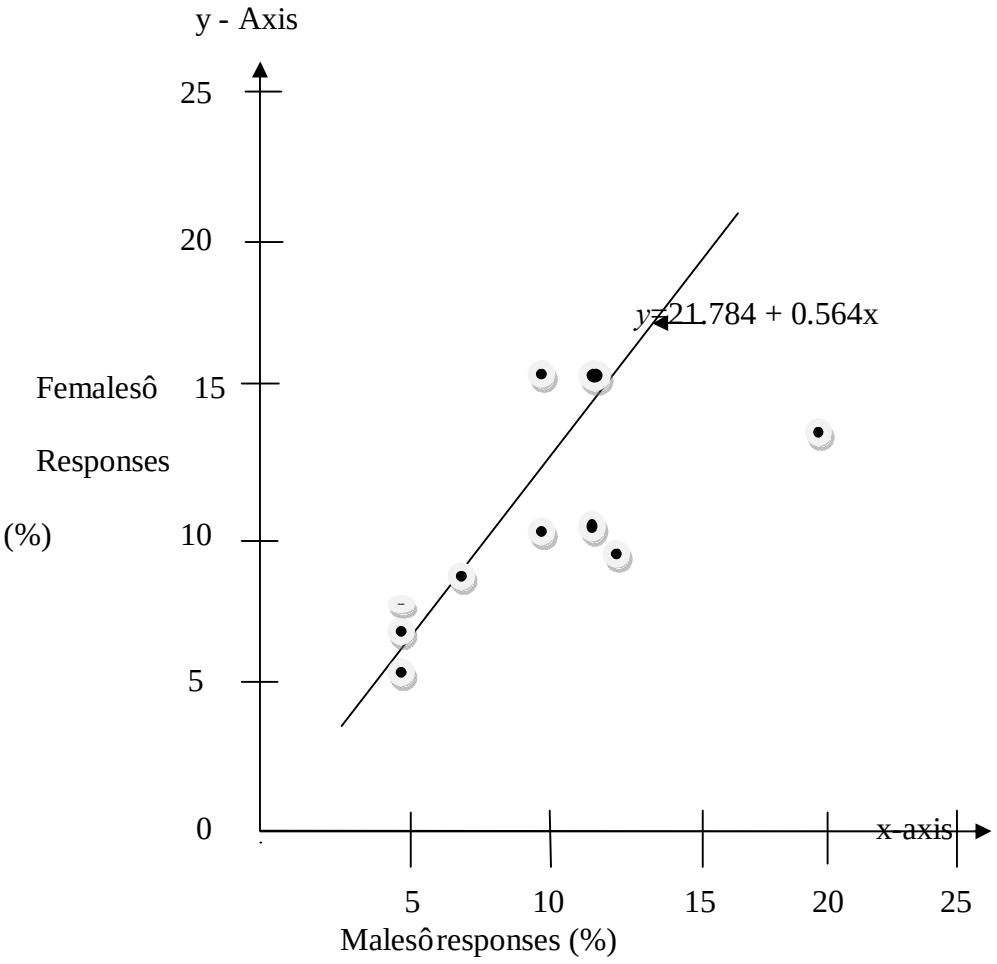

Figure 4.6: Scatter Plot Graph, Equation and Regression Line Presenting Exosystem Variable Determined on Adoption of Preventive Behaviours Against HIV Infection

Moreover, the scatter plot graph, equation and regression line was presented in Figure 4.6.This figure indicated presence of linear, positive direction of the relationship between independent variables and dependent variable. In this figure the independent variable was exosystem variables and dependent variables was adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The regression line sloped upwards from left to right side. This line suggested presence of positive relationship between items of exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. This finding suggested that, increased items of exosystem variable that is accessibility to televisionôs messages, simultaneously lead to increase on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, and vice versa.

Similarly, the doted points were scattered. However, these doted points tended to cluster along the regression line and tended to indicate an image of linear relationship between independent variable and dependent variable in this study. Also, the regression line and scatter dot points suggested positive direction of the relationship between tested variables that was exosystem variables and level of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Again, close clustering of doted-point around the regression line in Figure 4.6 was significantly supported by the positive correlation coefficient *(r= 0. 75*) which was close to 1.0.

The positive regression coefficient (*y=21.784+ 0.564*x) also complied with doted points along the regression line. Therefore, these positive coefficients suggested presence of linear, positive direction, high magnitude of correlation coefficient and relationship between independent variable such as exosystem variable and dependent variable such as adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In addition, the strong positive correlation coefficient *(r = 0.75)* and regression coefficient *(y = 21.784 + 0.564x*) suggested that, an increase of items of exosystem variable such as accessibility to internetôs message, simultaneously increased adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Therefore, these findings attracted the conclusion that, there was a statistically significant relationship between items of exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Moreover, to enhance more understanding of the findings of this study, structured and ranked data were collected. The findings were presented in summative rating Likert scale (Appendix E.) of this report. The reported additional items of exosystem variable in ordinal scales determined the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, was as follows: Receiving positive reinforcements as consequences of adoption of preventive behaviours against HIV infection among secondary school students, all respondents agreed this item.

This finding was found to be statistically significant and was in positive direction of relationship between independent variable and dependent variable (*rho= 0.75, df= 5, p. = 0.002, two tailed test).* This finding implied that in the context of psychological operant conditioning learning theory, found by Skinner and Thorndike (Feldman, 1999), application of positive reinforcement theory, can accelerate adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, as presented in (Appendix E).

Similarly, receiving negative reinforcements as a consequence of non adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, was accepted as a significant determinant variable, most respondents agreed this variable. These findings was found to be statistically strong, significant and was in positive direction of relationship between exosystem variable and adoption of preventive behaviour against HIV infection among secondary school student in Njombe region, Tanzania (*rho=0.83, df =5, p. = 0.001, 0.05 level of significance two tailed test)*. Thus, in the perspective of Operant conditioning learning theory advocated by Skinner and Thorndike (Feldman, 1999), application of negative reinforcements theory can determine adoption of preventive behaviour against HIV infection among secondary school students in Njombe region, Tanzania (Appendix E).

In addition, use of transparency style in advocating and receiving knowledge on preventive behaviour against HIV infection among secondary school students in Njombe region, was confirmed to be a significant determinant variable in this study(Appendix E). Most respondents accepted transparency style in advocating and

receiving knowledge on preventive behaviours. This finding indicated existence of statistically strong significant, positive direction and relationship between an item of exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region (*rho= 0.74, df=5, p. =0.003, at 0.05, two tailed tes*t).

Also, this finding implied that, transparency communication and advocating for preventive behaviours increased the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region (Appendix E). Furthermore, credibility of the channels used to transmit message on preventive behaviour against HIV infection among secondary school students in Njombe region, was confirmed as significant determinant variable.

The finding of this study indicated that, both male and female respondents strongly agreed importance of credibility of channel used to transmit message on the preventive behaviours (Appendix E). This finding was found to be statistically, significant and was in positive direction of relationship between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania (*rho = 0.66, df= 5, p. = 0.000, at 0.05, two tailed test*) as presented in (Appendix, E) in this report.

These findings implied that correctness, consistency and trusted channels of communication used to transmit information on preventive behaviours against HIV infection to students of secondary schools of Njombe region, accelerated trusts among audience. As a result, the credible channels of communication determine on

adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. These findings complied with the Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988; Lewis *et al.,* 2003).

That exosytem variable can indirectly influence behaviours of individuals in lower ecological systems such as mesosytems and microsystems. In the framework of Spearman rank correlation coefficient test (rho), the findings of this study suggested that, there were less than 5% chances that random error could account for these findings of this study. Thus, the findings of the present study were valid, reliable and acceptable information.

4.4 Findings from the Multiple Correlation Coefficients analysis

The multiple correlation coefficientsô equation was used to examine significance of findings of this report. In this report, multiple correlation coefficient *(R*) was calculated by using the coefficients (r) of three independent variables of this study. The independent variables were perception, microsystem and exosystem .The correlation coefficients were: perceptionôs correlation coefficient *(Pearson r = 0.95*), microsystemôs correlation coefficient (*Pearson r=0.82*) and exosystemôs correlation coefficient *(Pearson r = 0.75).* Also, in this report, correlation coefficient of perception variables and correlation coefficient of microsystem variable were categorized as independent variables. Correlation coefficient of exosystems variables was categorized as dependent variable. This Operationalization enhanced computation process as required by the formula for calculation of the multiple correlation coefficients *(R),* as recommended by (Bluman, 1998).

$$R = \sqrt{\frac{r^2_{yx1} + r^2_{yx2} - 2r_{yx1} \cdot r_{yx2} \cdot r_{x1x2}}{1 - r^2_{x1x2}}}$$

Where: R = multiple correlation coefficient.

r_{yx^1} = value of correlation coefficient for perception variable *(r= 0.95)*

r_{yx^2} = value of correlation coefficient for microsystem variable (*r = 0.82)*

$r_{x_1x_2}$= value of correlation coefficient for exosystem variable (r= *0.75)*

Substituting into the formula and solve for the multiple correlation coefficient (R), one gets:

$$R = \sqrt{\frac{(0.95)^2 + (0.82)^2 - 2(0.95)(0.82)(0.75)}{1 - (0.75)^2}}$$

$$= \mathbf{0.9638}$$

Therefore, in this study the multiple correlation coefficient between perception, microsystem and exosystem variables was found to be *(R= 0.9638*). These findings suggested that, the three psychosocial determinant variables (perception, microsystem and exosystem independent variables), positively, correlated and jointly determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region**,** Tanzania.

Moreover, multiple correlation coefficients (*R*) combined and examined a set of three predictor variables such as perception, microsystem and exosystem variables determining a single dependent variable. These three predictor variables facilitated greater accuracy and certainty of prediction of the dependent variable on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Tanzania.

The combined predictor variables were stronger and provided accuracy prediction of the dependent variable, than could be for one predictor variable such as perception independent variable only. Multiple correlation coefficients (R) are more powerful than a single correlation coefficient between one independent variable and one dependent variable. Therefore, in this report, the multiple correlation coefficients enhanced to increase accuracy of prediction process of contribution of perception, microsystem and exosystem variables on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

4.5 Results from Multivariate Regression Analysis

This section presented data analysis and presentation of findings by using multivariate regression analysis technique.

4.5.1 Application of Multivariate Regression Analysis

The findings of this study presented in Table 4.2; 4.3; and 4.4, in this chapter were subjected to the multivariate regression statistical analysis. In this study, the multivariate regression analysis indicated that, combination of the three independent variables, perception, microsystem and exosystem had significant strong relationship on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region (*Multiple R = 0.85, p<, 0.05, two tailed test*).as presented in (Appendix F). Again, high multiple regression coefficient *(R = 0.85),* indicated that, perception, microsystem and exosystem independent variables were significant determinants on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Similarly, the multivariate regression analysis of Beta coefficient (ϐ) indicated that, perception, microsystem and exosystem independent variables were powerful significant strong predictors of the variation of the dependent variable, on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region *(β = 0.63, p< 0.05 two tailed test*) as presented in (Appendix F).

4.5.2 Findings from Logistic Regression Analysis

The findings of this study presented in the contingency Tables, 4.2, 4.3 and 4.4 in this chapter, were subjected to the multivariate logistic regression statistical analysis. In the present study, Multivariate logistic regression analysis revealed that, the combination of perception, microsystem and exosystem independent variables had significant, strong , positive and linear relationship on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region (*Multiple R = 0.76, p< 0.05, two tailed test)* as indicated in (Appendix G). Also, high multiple logistic regression coefficient (*R= 0.76)* revealed that, perception, microsystem and exosystems independent variables were strong and significant determinants on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Likewise, the multivariate logistic regression analysis of Beta coefficient *(β)* revealed that, perception, microsystem and exosystem independent variables were powerful significant and good determinant variables on changes of the dependent variable that is adoption of preventive behaviours against HIV infection among secondary school students in Njombe region *(β= 0.59, p< 0.05, two tailed test*) as

reported in (Appendix G) in this report. Multivariate regression analysis and multivariate logistic regression analysis were preferred and used in this study, because they facilitated joint analysis of three independent variables, which are perception, microsystem and exosystem variables. These variables were jointly examined to understand their determinant process on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In this study, multivariate regression analysis and multivariate logistic regression analysis indicated existence of significant, positive and linear relationship between, perception, microsystem, exosystem independent variables and adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania.

4.6 Conclusion for Chapter Four

The first task of this study was to examine, whether there was no statistically significant relationship between perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The findings of statistical test used in this report suggested that, there was positive direction, statistically significant, linear relationship between perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The statistical tests supporting these findings included *($r= 0.95$, $df = 8$, $p < 0.05$, two tailed test*).These findings are from correlation statistical analysis.

Also, the approved significant items of perception variable determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region included the following: Credibility of preventive knowledge against HIV infection among secondary school students, susceptibility to HIV infection among secondary school students and primacy effects of knowledge delivered to empower students to adopt preventive behaviours against HIV infection among secondary school students. Therefore, the findings suggested that, there was statistically significant relationship between perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The second task of this study was to analyze, if there was no statistically significant relationship between microsystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. In this report the results of statistical tests, suggested that, there was strong, positive direction, and statistically significant, linear relationship between microsystem variables and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The statistical tests supported these findings included *($r= 0.82$, $df = 8$, $p < 0.05$, two tailed test)*. These findings are from correlation statistical analysis. The approved significant items of microsystem variable that determined adoption of preventive behaviours against HIV infection among secondary school students in Njombe region included: Receiving social supportive socialization in schools, families, churches/ mosques, and counselling in health care systems.

Hence, the findings indicated that there was statistically significant, positive direction and linear relationship between microsystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The third and last task of this study was to synthesize, if there was no statistically significant relationship between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The findings of statistical tests suggested that, there was strong, positive direction, statistically significant and linear relationship between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The statistical tests supported these findings included *(r= 0.75, df = 8, p < 0.05, two tailed test)*. These findings are from correlation statistical analysis.

Similarly, the accepted specific significant items of exosystems variable that determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region included the following: Accessibility to television, print media and radioôs messages influenced adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Thus, the findings indicated that there was statistically significant, strong, relationship between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The next chapter presents discussion of the findings of the study.

CHAPTER FIVE

DISCUSSION OF THE FINDINGS OF THE STUDY

5.1 Introduction

This chapter presents discussion of the main findings which were presented in chapter four of this study. The discussion is structured according to specific research objectives and research hypotheses. The purpose of this study was to investigate how perception and ecological variables presented in the Bronfenbrennerôs Ecological Systems Theory, determined adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The purpose of this study was implemented by setting three specific research objectives, complimented with three research hypotheses. The first hypothesis predicted that, there was no statistically significant relationship between items of perception variable, and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The second hypothesis predicted that, there was no statistically significant relationship between microsystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The third hypothesis predicted that, there was no statistically significant relationship between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The objectives and hypotheses of this study were implemented by administering and analysis of questionnaires which provided the findings of this study as presented in chapter four of this thesis.

5.2 Discussion of the Findings

5.2.1 Perception Variable Influenced Adoption of Preventive Behaviours against HIV Infection among Secondary School Students in Njombe Region, Tanzania

The first hypothesis predicted that, there was no statistically significant relationship between perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. However, the findings in this study indicated that, there was statistically significant relationship between perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The main findings and their implications .is discussed in the following sections.

5.2.1.1 Credibility of Preventive Knowledge against HIV Infection among Secondary School Students

This study examined details of perception variables, such as perceived credibility of preventive knowledge against HIV infection, determined adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. The findings of this study was significant supportive to the predicted alternative hypothesis, that there was significant positive relationship between perception variables such as credibility of preventive knowledge against HIV infection, and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. These findings were supported by the results published in the literatures for social psychology domain (Franzoi, 2000; Horowitz,*et al.,*1995 & Myers, 2008). Most respondents supported that perceived

credibility of preventive knowledge against HIV infection was a determinant of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In addition, this finding implied that, credibility of the preventive knowledge against HIV infection was enhanced by the expertise of the communicator cum counsellor as well as quality of the message delivered to the receivers. These findings implied that, the quality of validity and reliability of preventive knowledge against HIV infection accelerated significant adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. These findings were consistent to those reported by (Franzoi, 2000; Horowitz *et al.,* 1995; Myers, 2008).

Likewise, these findings of credibility of preventive knowledge against HIV infection, indicated that, the message must be correct, empirical and concrete information such that can accelerate and persuade the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Also, the findings implied that, expertise of the communicators such as counsellors and teachers in secondary schools, improves credibility of the preventive knowledge against HIV infection in secondary schools, leading to accelerate the process of adoption of preventive behaviours against HIV infection among secondary school students.

As reported by Horowitz *et al.,* (1995) communicatorôs, expertise involved having quality of credentials, good training and knowledge which lead to improve the credibility and acceptability of the preventive knowledge delivered by the

communicators in secondary schools. These findings implied that, the level of credibility of secondary school teachers and preventive knowledge against HIV infection, determine the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. That, high level credibility of secondary school teachers on preventive knowledge against HIV infection accelerate the rate of adoption of preventive behaviours such as use of VCT services against HIV infection among secondary school students in Njombe region.

Also, the perceived credibility of preventive knowledge against HIV infection ought to be impartial, vivid and attractive to the clients. This quality of preventive knowledge increases the rate of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Trustworthiness refers to receiverôs evaluation of the communicatorôs perceived personality character and motive for delivering the persuasive message, as supported by (Franzoi, 2000; Horowitz *et al.,* 1995; Myers, 2008). Thus, in this study findings indicated that, in reality communicatorôs positive characters and positive motive of delivering the preventive knowledge against HIV infection to students, lead to increased process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In addition, the findings of the present study comply with the research results reported in the literatures (Franzoi, 2000; Horowitz *et al.,* 1995 & Myers, 2008). These findings complied because they used similar research methodology that is quantitative research approach. Also, the findings of this study indicated that,

effective persuasive communicator, channel, message and receiver possess the following characteristics: Effectiveness use of facts, this pertains to message such as preventive knowledge against HIV infection, being enriched with scientifical facts and numerical statistical findings.

The empirical knowledge attracts clientsô attention leading to effective persuasion. In the context of the findings of this study, the preventive knowledge enriched with empirical findings attract clientsô attention, interests and concentration, leading to increased process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Also, effective use of vivid images, this refers to delivering message concentrated with graphic colourful elaboration that attracts and holds audienceôs attention (Horowitz *et al.,* 1995). In this study, this finding means the preventive knowledge ought to be presented with vivid and attractive graphic materials to convince the secondary school students to increase the rate of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Evidence based knowledge (massage) is effective in enhancing persuasion when attributed to a highly credible source of the message. Thus, in this study teachers in schools as credible sources of prevention knowledge against HIV infection when deliver prevention knowledge that contain enough evidence can persuade students to increase the rate of adoption of preventive behaviours against HIV infection among secondary school students. This finding of the present study were supported with findings published in the literature by (Franzoi, 2000; Myers, 2008; Widman *et al.,* 20140). Also, the findings of the present study, comply with the first alternative

hypothesis, which predicted that, there was a statistically significant relationship between perception variables and adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania.

Likewise, the findings in the present study indicated that, use of humour increase attention and persuasiveness power of the preventive Knowledge. Research indicates that using humour in persuasive message and knowledge does increase audienceôs attention, concentration, interest, trust, persuasibility and belief to messages delivered as supported by (Franzoi, 2000; Horowitz *et al.,* 1995). The communicators, who inject humour into their message, tend to enhance increased likability into the mind of their audience (Myers, 2008). Therefore, communicators can use humour in their presentation of message content to persuade the audience to adopt the delivered message correctly and at high level rates. That, the findings reported into the literature (Horowitz *et al.,* 1995) are very supportive and comply well with the findings of the present study. Thatôs for effective presentation of the message such as preventive knowledge against HIV infection among secondary school students, it is important to use humour. The humour facilitates persuasion, leading to accelerated rate of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The findings of this study complied with findings from previous studies reported in literatures because of using similar research methodology that is quantitative research approach. This approach insist adherence to validity and reliability of tools of data collection and findings. As a result, quantitative research approach leads to similarity of findings of these studies.

In addition, use of two- sided logical arguments to enhance effective persuasion of the audience, pertains to two way communications between the sender and receiver of the message that is knowledge for preventive of HIV infection among secondary school students. The two- way sided logical argument is recommended because is more effective in delivering persuasive message that is knowledge to the audience (Franzoi, 2000). Also, the two way communication logical arguments facilitate gain of feedback between the source of message and the receiver of the message. Also, it increases the communicatorôs trustworthiness leading to high credibility of the sender of message. As a result, the message causes more effectiveness at persuasion of the audience (Myers, 2008).

The findings from the literature (Franzoi, 2000; Horowitz *et al.,* 1995) comply with the results of the present study. The two-way communication was emphasized, because it motivated both the sender such as teachers/counsellors and clients such as secondary school students in schools in the process of sharing the credible preventive knowledge against HIV infection in schools. Also, two-way communication facilitated and complied with the Bronfenbrennerôs Ecological System Theory (Bronfenbrenner, 1988). This Theory encouraged and recommends interaction and sharing preventive knowledge in all five ecological systems such as microsystem, mesosystem, exosystem, macrosystem and chronosystem variables as recommended by (Franzoi, 2000 ; Lewis *et al.,* 2003).

Similarly, the finding of this study indicate that, in reality and application of the findings of this study, repetition delivery of a message enhanced persuasiveness power of the message that is preventive knowledge against HIV infection. Repetition

delivery of the knowledge pertain to successive systematic presentation of the message to the receiver for a considerable duration leading to permanent change of the behaviour of the receiver such as secondary school students in Njombe region, Tanzania. Also, in this study, findings indicate that, repetition presentation of message facilitated to increase its credibility, believability, fluency of presentation, likability, and memory among the audience and permanent change of behaviour to cope with the persuasive message, such as preventive knowledge against HIV infection among secondary school students.

The literature complies with the findings of this study. Repetition presentation of credible preventive knowledge against HIV infection to the receivers such as secondary school students, tend to increase the liking of the message about HIV preventive behaviour in secondary schools in Njombe region. Again, repetition presentation of massage about preventive education against HIV infection instilled into memory among the receivers, leading to increased interest of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. This finding of the present study complies with previous results reported by (Bankole *et al.,* 2008; Franzoi, 2000; Ojieabu *et al.,* 2008).

Repetition presentation of message with variation of format and contents of the message, tend to reduce the wear-out effects and the diminishing return point effects. Thus, variation of the format of presentation of the message, that is credible preventive knowledge against HIV infection, tend to sustain interests of the receivers, leading to enhance persuasion power of the message and adoption of

preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Moreover, in the context of practical application in real ecology, the findings of the present study require adherence to code of ethics for teachers, councillors, parents, health experts and faith leaders. That adherence to ethics is important because it facilitate adoption of preventive behaviours against HIV infection among secondary school students in school microsystems. Therefore, the findings of this study deserve to be implemented in real practical ecology, to facilitate adoption of preventive behaviours against HIV infection in school microsystems. In addition, in the context of implication and application of these findings, credibility of preventive knowledge is important in the struggle to combat HIV infection in secondary school microsystems. These findings means validity and reliability of preventive and ethical ecological systems in secondary schools can facilitate increase of adoption preventive behaviours such as use of VCT services among secondary school students in Njombe region, Tanzania.

Similarly, application of these findings in reality indicates that, until now, there is no cure for HIV infections across the World. Thus, adoption of preventive behaviours against HIV infection is the only weapon to combat HIV infections in school microsystems and entire ecological systems. Hence, these findings practically can be used in real ecological systems to improve validity and reliability of preventive knowledge. As a result, increased adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In addition, interpretation based on theory, indicated that, the findings of this study correctly complied with the Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988). Message which means knowledge is a component of ecological systems. The credibility status of the preventive knowledge determines the behaviour functions of the individual student within the microsystem such as secondary schools. Also, communication systems and its credibility determine level of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Thus, the findings of this study correctly comply with the Bronfenbrennerôs Ecological Systems Theory that guided the discussion of the findings of this study.

5.2.1.2 Perceived Susceptibility to HIV Ifection among Secondary Shool Sudents

The findings of this study indicated that, susceptibility implied level of vulnerability of the individual client to the attack of dangerous risk behaviour such as alcoholism which leads to HIV infection, if preventive measures are not implemented immediately to prevent the perceived severe behaviour (Agha, 2003; Underwood, 2006; Wolfgang *et al.,* 1996). Also, susceptibility implied level of the risk of acquiring a psychological threat, if no protection measures performed to prevent the threat such as HIV infection.

The findings of this study confirmed that, perceived susceptibility to HIV infection among secondary school students in Njombe region, Tanzania, was a significant perception related variable, determined adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Also, in this study, most respondents supported that perceived susceptibility to HIV

infection among students, was a significant determinant variable on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. These findings were significantly supportive to the alternative hypothesis of this study. There was statistically significant relationship between perception variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The implication of these findings was that, perceived susceptibility to HIV infection regulated the process of adoption of preventive behaviours against HIV infection; the high is the level of susceptibility to HIV infection, the high the process of adoption of preventive behaviours against HIV infection among students. As a result, lower level of susceptibility to HIV infection, lead to lower adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, and vice versa.

Similarly, perceived susceptibility to HIV infection among students determine and empower individualôs sensation and perception about the following psychosocial factors: Existence of the health- impairing behaviours such as HIV infection; administer cost-benefit analysis to quantify procedures and cost for combating the health impairing behaviour such as HIV infection; determine strength of the health impairing behaviour and required efforts to escape infection of HIV; determine trend of the health impairing behaviours if is developing at high rate or declining and determine the vulnerability level of probability of individualôs being attacked by the threat such as HIV infection. The findings of this study indicates complies with those reported by (Tarkang, 2014a; Wolfgang *et al.,* 1996).The complies of findings was

caused by sharing research methodology, specifically quantitative research approach that insist validity and reliability of tools of data collection and findings of the study.

In addition, the perceived susceptibility to HIV infection among students enhanced to determine availability of scientific measures to combat the health impairing behaviour such as HIV infection; determine rate of multiplication and spread of the HIV, determine means of infection, symptoms of the virus, type and amount of the psychosocial efforts required to combat the health impairing behaviour such as alcoholism that lead to HIV infection. Again, perceived susceptibility to HIV infection activated individuals to determine timing about when to seek, deliver prevention measures and adopt preventive behaviours to combat HIV infection among secondary school students in Njombe region, Tanzania. The findings of this study was in line to the finding reported by other studies (Gatta *et al.,* 2006; Kibombo *et al.,* 2007; Underwood *et al.,* 2006; Wolfgang *et al.,* 1996).

Furthermore, perceived susceptibility to HIV infection facilitated beliefs in the effectiveness of particular scientific preventive behaviours to avoid threats of the HIV infection for example, attending VCT to prevent HIV infection. VCT is a preventive behaviour against HIV infection. However, the perceived susceptibility to HIV infection, activate the client such as students of secondary schools to evaluate and adopt or not adopt the VCT services for prevention of HIV infection in secondary schools in Njombe region, Tanzania. Also, perceived susceptibility to HIV infection among secondary school students, enhance to determine and obtain health treatment measures to combat the health impairing behaviour, such as

alcoholism challenges. Treatment of individualôs alcoholism, minimize probability chances of HIV infection among secondary school students in Njombe region, Tanzania.

Moreover, the perceived susceptibility to HIV infection among secondary school students guide individuals to realize and avoid risk behaviours such as alcoholism and multiple sexual partners in secondary schools. As a result, the individual student avoid the risk behaviours because of awareness about the susceptibility level to being attacked by the health impairing behaviours such as increased HIV infection rate in secondary schools in Njombe region. These findings indicate that, preventive knowledge needs to be concentrated with empirical information that increases understanding of susceptibility to secondary school students. Hence the students increase adoption of preventive behaviours against HIV infection. These findings of the present study complied with results of previous studies reported by (Mwamwenda, 2013; Wolfgang *et al.,* 1996).

Furthermore, a study conducted in Kenya, reported that, the adolescents who perceived at higher susceptibility of HIV infection were ready to adopt and use the preventive behaviours against HIV infection in schools and out of schools. Also, increased beliefs on severity of HIV infection lead to adoption of preventive behaviours against HIV infection among adolescents in and out of schools (Agha, 2003). These findings of a previous study was consistent with the findings of a present study that susceptibility to HIV infection is a significant determinant perception variable that influenced process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The consistency of findings were caused by sharing, similar research methodology, specifically, quantitative research approach that used by (Agha, 2003) and this study.

Similarly, a study conducted in Zambia, reported that, the risk- reduction media campaign among adolescents, enhanced increased persuasiveness about HIV/AIDS risk and the need to adopt preventive behaviours against HIV infection among adolescents in secondary schools in Zambia (Underwood, *et al.,* 2006). This finding implied that, increased persuasion about susceptibility to HIV infection among adolescents, forced the adolescents to adopt preventive behaviours against HIV infection among secondary school students in Zambia. Hence, these findings were consistent with the confirmed alternative hypothesis of this study, that there is a statistically significant relationship between perception variables and process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Also, a study conducted in Mbonge subdivision of rural Cameroon among secondary school students, found out that, 39.4% (N=210) female secondary school students perceived themselves to be at high risk of HIV infection. As a result, the perceived susceptibility to HIV infection compelled to adoption of preventive behaviours such as sexual abstinence, against HIV infection among secondary school students in rural Cameroon (Tarkang, 2014a). This finding of the previous study complied with the findings of this study. Hence, interpretation on the basis of related previous research, complienceability between these past and present findings confirmed that the findings of this study were correct and of acceptable quality.

Moreover, interpretation based on theory, indicate that the findings of this study complied correctly with The Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenners, 1988) and Health belief model (Stroebe *et al.,* 1996).that, individualôs perceived susceptibility and perceived severity to the health impairing behaviours, lead to belief in a personal health threat. Consequently, the risk individual opts to adopt health preventive behaviours to combat the health impairing behaviours.

Also, the Health belief model advocated that, the individual perceived benefits of the use of the health preventive behaviours, lead to beliefs in the effectiveness of a health preventive behaviours. As a result, the individual can adopt and use the preventive behaviours such as attending VCT services to avoid HIV infections in secondary schools in Njombe region, Tanzania. The findings of the present study, also, comply correctly with the results reported in the literatures (Wolfgang, *et al.,* 1996).

However, on the basis of interpretation based on statistical procedures, the findings of this study indicated the need to present empirical findings and graphical presentation of the findings about HIV infection among secondary school students in Njombe region, Tanzania. That, empirical figures are most powerful enough to persuade the students in secondary schools to realize the level of their susceptibility to HIV infection. As a result, the high HIV infection rates presented in empirical rates among the secondary school students can accelerate the process of adoption of preventive behaviours, such as attending VCT services among secondary school students in Njombe region, Tanzania.

5.2.1.3 Primacy Effects of Knowledge Delivered to Students

Primacy effects of preventive knowledge delivered to empower students to adopt preventive behaviours against HIV infection in secondary schools, was confirmed as statistical significant determinant item in this study. Primacy effects, indicates that other factors being constant, information presented first, are more powerful to initiate persuasion to the audience leading them to change their behaviour to cope with the aim of the sender of the message as supported by (Franzoi,2000; Horowitz *et al.,* 1995;Myers,2008).

The findings in this study indicated that, most respondents agreed, that primacy effects of knowledge delivered to empower students to adopt preventive behaviours against HIV infection, was statistically significant. This finding implied that, information delivered to the secondary school students earlier caused significant impact to change behaviours than information delivered later as supported by (Franzoi,2000; Myers,2008).

In the context of this study, guided by the Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988) the findings of this study implies that the prevention services ought to punctually deliver message on preventive behaviours against HIV infection among secondary school students. Thus, such punctuality timing can accelerate the rate of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region and vice versa. On contrary, message on preventive behaviours presented later, can insufficiently be adopted due to primacy effects of delivering message to the audience.

Moreover, on the context of interpretation related to previous research results, these findings correctly complied with the reports presented in the previous literatures as follows: Franzoi (2000) reported that, timing of message presentation to the receivers determines the rate of persuasiveness power of the message due to primacy effects. Franzoi (2000) add that, when two communicators send their persuasive argument message and given enough time to elapse between the deliveries of persuasive message and the audienceôs decision, first communicator of the message can be more persuasive due to primacy effects.

These findings means the first presented information caused more persuasion to the audience than later presented information. Also, the findings of this study complied well with the findings reported in the literatures about previous studies (Franzoi, 2000; Horowitz *et al.,* 1995). On the basis of interpretation related to research methodology, the previous studies such as (Franzoi, 2000; Horowitz *et al.,* 1995; Myers, 2008), shared quantitative research approach, with the present study. As a result, findings were related between previous and present study.

According to the law of primacy, the message presented first has more persuasive power and create more impact to the receiver than the message presented later. A study conducted to investigate adolescents sexual health communication found out that, communication format, primacy or recency, determined process of adoption of preventive behaviours against HIV infection among adolescents including secondary school students (Widman *et al .,* 2014). Therefore, on the basis of interpretation based on theory, the findings of this study indicated that timing of presentation of information about preventive behaviours to the students; determine the process of

adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The application of these findings in real ecological systems, preventive knowledge should be used with punctuality to facilitate adoption of preventive behaviours against HIV infection among secondary school student in Njombe region, Tanzania.

5.2.2 Microsystem Variable Influenced on Adoption of Preventive Behaviours against HIV Infection among Secondary School Students in Njombe Region, Tanzania

The second hypothesis in this study, predicted that, there was no statistically significant relationship between microsystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. However, the findings of this study indicated that, there was statistically significant relationship between microsystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The findings indicated that, the main specific significant items were discussed in the next sections.

5.2.2.1 Receiving Social Supportive Socialization in School Systems

Receiving social supportive socialization process in school systems was confirmed to be statistically significant determinant of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. These findings indicated that, socialization implies social interaction process through which persons learn and develop an awareness of social norms, values, sense of self identity and cultural beliefs. Socialization process progress through outs the lifespan

of a person. On the basis of interpretation based on theory, these findings comply with Bronfenbrennrôs Ecological systems theory. That, socialization process of an individual is enhanced by the socialization microsystems such as schools, families, faith based organisations including Church and Mosque, peer groups and mass media (Giddens, Duneir, Applebaum & Deborah, 2012). These findings indicate that, a school is a social institution that instils knowledge, skills, universal values and norms into the personôs mind. As a result, the schooling process lead to change the level of individualôs knowledge, attitude, socialization process and behaviour practices of the learner in the context of school as a microsystem (Giddens *et al.,* 2012; Robertson, 1988; Schaefer, 2011).

Moreover, this study examined the contribution of a school variable as component of microsystem to determine process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Tanzania. The findings of this study were supportive that socialization in schools, significantly determined the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Most respondents supported the social supportive socialization in school systems, was a significant determinant of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Therefore, the findings of this study, confirmed that a school as microsystem component of socialization possess significant power that can determine to facilitate or hinder the process of adoption of preventive behaviours such as sexual abstinence, avoiding alcoholism and attendance in VCT services, against HIV infection among

secondary school students in Njombe region, Tanzania.

Similarly, the findings of this study complied well with results of other previous studies that were reported into the literatures (Giddens *et al.,* 2012). The findings of this study complied with findings of other studies due to use of similar research methodology, specifically quantitative research approach. That, a school as socialization microsystem, inculcated into adolescentôs mind and enhanced the adolescent to adopt the skills, attitudes and preventive behaviours against HIV infection in schools.

The school instilled formal knowledge and skills on writing, reading and arithmeticôs, instilled into adolescents, universal values, norms, beliefs, moral, life skills, rules, attitudes, discipline and time management according to school time table. Also, the school has been reported to instil into young people behaviour of dressing code approved by the school and community, respect authority of teachers, parents and faith leaders, hardworking in academic learning to pass and survive screening in examinations. Also, other behaviours instilled are learning and adherence to health preventive behaviours such as sexual abstinence and avoiding alcoholism. Thus, young people adhere to adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, and other countries in the World as suggested by studies (Giddens *et al.,* 2012; Macions, 1999; Robertson, 1988 & Schaefer, 2011).

Likewise, the findings of this study implied that, schools as socialization microsystems, has been reported into the literatures to enhance young people to

adopt the behaviours that facilitate adoption of preventive behaviours against HIV infection in schools. The behaviours instilled into students in schools included: Skills to live and learn successfully in crowd out of family members, punctuality, self independent life outside the family, neatness, observe silence in school setting, obedience and respect instructions from approved authorities without hesitations , fair competition in academic tasks, learn and experience bureaucracy in form of adherence to time table and almanac. The young peopleôs adherence to these skills obtained through socialization process; facilitate adoption of preventive behaviours against HIV infection among secondary school students in schoolsô settings as reported by research studies (Giddens *et al.,* 2012; Macionis, 1999 & Schaefer, 2011).

Furthermore, school as socialization microsystem, has been reported into this study and was supported by the literatures of previous studies that, it enhanced the adolescents in school settings to facilitate adoption of the following approved behaviours: Adherence to good loyalty, honest, discipline, equality, attitudes, self identity, self concepts acceptable to the school and entire community. Also, the findings reported into this study and the previous literatures indicated that, the school is powerful enough to inculcate into young peopleôs mind positive thinking and perceptions of patriotism, nationalism, justice, honest, democracy, faithfulness, trustworthiness, diligent in performing tasks, conformity, obedience, cooperation, health care behaviours and moral life as reported in the published literatures (Kendall, 2008; Macions, 1999; Schaefer, 2011). Hence, adherence to these good values, norms, morals, honest and discipline variables in school settings facilitate

adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Moreover, the findings of the present study complied with the results of the following study. A study conducted on school-based HIV prevention programme for African youth, reported significant contribution of schools to HIV prevention programme. That the school based HIV risk prevention programme enhanced increased knowledge against HIV infections among students; increased attitude changes towards favourable risk reduction against HIV infection; delayed sexual debut, and decreased number of sexual partners (Gallant *et al.,*2004).

However, the findings suggested that, knowledge and attitudes was the easiest to change and instil sustainable preventive knowledge and attitudes against HIV infection in school settings. On contrary, it was difficult to change behaviours such that it can comply with high level of HIV preventive knowledge and attitude possessed by the students in schools. As results, most students in schools have high knowledge and attitudes about HIV prevention behaviours, but in real practice they continue practicing HIV risk behaviours. Therefore, the school as a socialization microsystem, it can determine to facilitate or hinder the process of adoption of preventive behaviours against HIV infection among secondary school students in various school settings including Njombe region, Tanzania.

Similarly, a study on impact of school based HIV prevention, conducted in Liberia; its findings indicated that, the intervention significantly impacted on studentsô adherence to: protective behaviours among peers. The protective behaviours

included positive attitudes towards condoms use and increased frequency of condom use (Atwood, Kennedy, Schamblem, Tegli & Garber *et al.,* 2012). Moreover, a study conducted in schools microsystem setting reported that most secondary school students preferred VCT on HIV/AIDS to be conducted in school settings. The school settings enhanced adhered to privacy and confidentiality during delivery of VCT services. Also, the student noted that, schools had credible, well trained and experienced teachers cum counsellors (Ajila, Ajila, Adeyomo &Owojori, 2009; Lawrence, Struthers & Hove, 2015).

These findings indicated the significant powers of a school as socialization microsystems that can shape the knowledge, attitude and behaviours of secondary school students. Thus, the findings of other studies comply with the findings of the present study that a school as a socialization microsystem can significantly determine to facilitate or hinder the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. In addition, another study conducted in secondary schools in Fako Division, South Western region in Cameroon, its findings were supportive to the present study.

The studyôs findings indicated that, secondary schools enhanced students to access preventive knowledge against HIV infection in school settings in Cameroon. However, some students (60%) adopted and practiced the preventive behaviours against HIV infection in schools while another (40%) failed to adopt and adhere to the preventive behaviours against HIV infection in Cameroon (Nubed & Akoachere, 2016). Therefore, these findings suggested the power of school as a socialization

microsystem, in relation to determining process of adoption of preventive behaviours against HIV infection among secondary school students in schoolsô microsystems.

Furthermore, a study investigated on knowledge, attitude and prevalence of HIV counselling and testing among secondary school young people in Imo state, Nigeria, reported that, most of the students had knowledge on HIV prevention by 99% (Iwu, *et al.,* 2017). Also, studentsô attendance in VCT) was 92% (Iwu, *et al.,* 2017). On contrary, most studentsô insufficiently changed their behaviours to reflect level of high preventive knowledge and attitude gained in HIV prevention education programmes in schools (Iwu, et *al.,* 2017). These findings implied that schools as socialization microsystems can successfully change process of adoption of preventive knowledge and attitudes against HIV/AIDS infection.

However, the school as socialization microsystem have insufficiently changed behaviours of students to prevent HIV infection in secondary schools in Nigeria and other countries including Tanzania. On the basis of interpretation based on previous research findings, other previous studies, that its findings complied with the findings of the present study on contribution of schools as socialization microsystem to determine adoption of preventive behaviours against HIV infection among young people, including secondary school students included (Cheng *et al.,* 2008; Jemmott *et al.,* 2010; Kalolo *et al.,* 2015; Nwaorgu *et al.,* 2009; Oladepo *et al.,* 2011; Thanavanh *et al.,* 2013 & Tosk *et al.,* 2016).

Thus, conformity of the present findings to result of previous studies indicates validity and reliability of the findings of this study. The similarity of findings of this

study was caused by sharing similar research methodology that is used quantitative research approach. This approach insists use of systematic, valid and reliable tools of data collections and findings. Also, use of similar statistical test, can lead to similarity of findings. Similarly, on the basis of interpretation based on theory, guided this study, the findings of this study complied with the Bronfenbrennerôs Ecological Systems Theory. The findings of this study suggested that, a school as a component of microsystem and mesosystem possess significant power to determine behaviours of individual students hosted into the school systems. Also, the school host individualsô students for a longer duration during childhood and adolescent stages of life span of human development. Thus, in the perspective of Bronfenbrennerôs Ecological Systems Theory, the findings of this study are of acceptable quality.

In addition, applications of schools microsystem in reality in the process of struggling to combat HIV infection among secondary school students in Njombe region, Tanzania. The findings of this study implied that, in real ecological system a school is well structured, powerful and facilitate to instil preventive knowledge into clientôs brain, host the leanerôs longer duration, and provide teaching on preventive behaviours, leaning, guidance and counselling on preventive behaviours for a longer life span. Thus, the findings of this study indicated that, in real practical ecological system, a school facilitate adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

5.2.2.2 Receiving Social Supportive Socialization in Families Systems

Receiving social supportive socialization process in family systems was statistically

confirmed to be a significant variable that determined adoption of preventive behaviours against HIV infection in secondary schools students in Njombe region, Tanzania. Family signify a permanent social economic group of people directly linked by kinship connections, marriage or adoption. A family is composed of father, mother and children as members of the nuclear family. Also, a family links extended family members composed of aunts, uncles, brothers, sisters, grand fathers and grand mothers (Giddens *et al.,* 2012; Kendall, 2008; Macionis, 1999; Robertson, 1988; Schaefer, 2011). This study examined whether or not, socialization process in a family microsystem determined process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

The findings of this study were significantly supportive that, socialization process in a family microsystem determined process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Most respondents supported social supportive socialization process in family systems variable. Therefore, these findings confirmed that, a family as a primary socialization microsystem, possess significant social powers that can determine to enhance or hinder the process of adoption of preventive behaviours such as sexual abstinence and avoid alcoholism against HIV infection among secondary school students in Njombe region, Tanzania, as supported by other studies (Giddens *et al.,* 2012; Kendall, 2008; Wamoyi, Fenwick, Urassa, Zaba & Stones, 2011).

Likewise, on the basis of interpretation related to research methodology, the findings of this study complied with the findings from previous literature because of sharing research methodology such as quantitative research approach. This approach

facilitated similarity of findings of this study and previous findings reported into the literatures (Giddens *et al.,* 2012). As a primary socialization microsystem, a family inculcated into young peopleôs mind and enhanced the adolescents including secondary school students to adopt preventive knowledge, skills, attitudes and behaviours that facilitated prevention of HIV infection in schools and families. As a result, the family as microsystem component has been confirmed by findings of this study to be a significant determinant on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Similarly, a family as a primary socialization microsystem has been reported into the literatures that it enhanced the young people to adopt variables which facilitated adoption of preventive behaviours against HIV infection in families and schools. The family instilled into adolescents approved communityôs values, norms, beliefs, morals, language and code of ethics for good moral behaviour. Also, the family provided informal and non formal learning process to get preventive knowledge against HIV infection. The family guided adolescentôs conformity to traditional standards of behaviour such as obedience to the rules of the family and community as supported by other studies (Giddens *et al.,* 2012; Kendall, 2008; Schaefer, 2011).

In addition, the family as primary socialization microsystem instil into adolescents mind life skills, attitudes, gender roles for adolescents, sense of self, self identity, ethnicity and communication skills as approved by the family and community. These factors were intended to shape the young peopleôs knowledge, attitudes behaviours and practices such that the adolescent could adopt the preventive behaviours such as sexual abstinence and attendance to VCT services to avoid HIV infection among

secondary school students in Njombe region, Tanzania and other countries as reported in published literatures (Kendall, 2008; Macionis, 1999; Schaefer, 2011).

Moreover, family as a primary socialization microsystem instil into the young people background foundation of knowledge that enhance the child and adolescents to join formal schooling process in formal schools that deliver formal education. The family instil into adolescents conformity to traditional approved standards of behaviours such as obedience to the rules, norms, values, attitudes and beliefs approved by the family and community. The family shape, nurture and regulate behaviour of the young people by using psychological punishment, positive reinforcements and negative reinforcements (Feldman, 1999), depending upon the adolescents behaviours as approved by the family and community (Giddens *al.,* 2012, Kendall, 2008 & Schaefer, 2011).

Also, a family inculcate into the adolescentôs mind curiosity skills, self initiative skills, self-control skills, sense of belonginess to the family, learn initiation rites, good reproductive health knowledge, health care behaviours and religious based parenting of adolescents (Kiura *et al.,* 1999). However, modernization process and Globalization of communication network systems has caused changes and divergence of cultural values, norms, morals, beliefs and perception of young people compared to parents,(Kitula *et al.,* 2014; UNESCO, 2001). As a result, the globalization and modernization forces has caused variation of perceptions on family and communityôs values, norms, beliefs and languages between adolescents including secondary school students and family members into the traditional community (UNESCO,2001).

Also, modernization process has weakened the traditional network between nuclear family and extended family. Consequently, adolescents including secondary school students insufficiently receive traditional socialization process from extended family members (UNESCO, 2001). Furthermore, modernization process has caused changes of family structures, composition, functions and time used by parents to perform socialization process with their adolescents. Traditional families had father, mother, children and extended family members. On contrary, during modernization era some of the families have single female parents and children or adolescents only. Other family has single male parents and children or adolescents only.

Other families have two parents, male and female with children or adolescents without extended family members. Some families have experienced divorce and re marriage. That only very few families have stable complete family structures, such that have both male and female parents, children or adolescents and good connection with extended family members. Also, in other families the parents spend most of the time at formal or informal work place such that they use insufficient time for socialization process with their children or adolescents as supported by other studies (Giddens *et al.,* 2012; Kendall, 2008; Kiura *et al.,* 1999; Oladepo *et al.,* 2011; Wamoyi *et al.,* 2011).

The variations of familyôs structure, size, composition, functions, communication among family members and little amount of time used to socialize between parents and adolescent, erode the familyôs powers to provide socialization process that could benefit the adolescents in families and schools. As a results, some families deliver maximum socialization services including adoption of preventive behaviours against

HIV infection, to their children and adolescents but other families provide insufficient socialization services to their children and adolescents. This finding complies with research finding published in the literature (Giddens *et al.,* 2012; Kendall, 2008; Wamoyi *et al.,* 2011). Therefore, as a basic primary socialization microsystem, familyôs status of structures, functions, size, time use and transparent communication can facilitate or hinder the adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In addition, the findings of this study complied with the findings published in literatures. That both findings of this study and literatures indicated that, families provide socialization process to their children and adolescents on the basis of their socio demographic characteristics such as familyôs race, ethnicity, education level, religiosity, economic class, social class, occupation, cultural values, norms, beliefs and morals, gender role, familyôs structure and nationality (Giddens *et al.,* 2012; Kendall, 2008; Kiura *et al.,* 1999). Thus, variation of socialization process based on socio demographic variables can lead to variations of the socialization process leading to variation of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region.

A study conducted on family communication about HIV/AIDS and sexual behaviour among senior secondary school students in Accra, Ghana, indicated that, communication about HIV/AIDS prevention between secondary school students and parents and other family members of the extended family, increased the rate of adoption of preventive behaviours such as condom use among secondary school students in Accra, Ghana (Adu - Mireku, 2003).

Similarly, another study (Beckett, *et al.,* 2010), reported that, many parents and adolescents insufficiently communicated about reproductive health knowledge before adolescentsô sexual debut. The reproductive health knowledge could help adoption of preventive behaviours against HIV infection among secondary school students. These findings implied that, a family is a strong socialization microsystem that can determine the process and timing of adoption of preventive behaviours against HIV infection among adolescents in microsystems such as families and schools. These findings means, a family is a strong socialization microsystem and can activate increase or decrease process of adoption of preventive behaviours against HIV infection among adolescents including secondary school students in schoolôs ecological systems.

Also, the findings of this study confirmed that, a family is a significant microsystem variable that determined adoption or insufficient adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. However, the familyôs structure and time for socialization process increased or decreased impact of the family to determine process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In addition, other findings on family as primary socialization microsystem that determined adoption of preventive behaviours against HIV infection among adolescents (Adeboye, et al., 2016; Aspy, Vesely, *et al.,*2007; Oladepo *et al.,* 2011; Resengard *et al.,* 2012 ;Widman, Choukas- Bradley, Noar, Nesi & Garrett, 2016). Furthermore, other studies that its findings complied with the findings of the present

study with regards to contribution of family as a basic primary socialization microsystem, that influence adoption of preventive behaviours against HIV infection among adolescents including secondary school students included (Bastien *et al.,* 2011; Miller *et al.,* 1998; Schiferaw *et al.,* 2014 & Yadeta *et al.,* 2014).

Moreover, on the basis of interpretation related to previous research studies, the findings of this study significantly comply and are consistent with findings of previous studies. The reasons for consistent findings were related to sharing research methodology, specifically quantitative research approach. This approach recommends use of structured systematic instrument of data collection, systematic data analysis, interpretation, presentation and discussion. Also, quantitative research approach recommends use of valid and reliable tools of data collections and its findings. As a result of using quantitative research approach, the findings of various studies that adopted quantitative research approach tend to report related findings. This study used quantitative research approach; as a result, its findings comply with findings of previous studies reported into literature (Franzoi, 2000; Myers, 2008). Therefore, the findings of this study are correct and acceptable.

In addition, on the basis of interpretation based on theory, the finding of this study about family as basic primary socialization microsystem, complied with The Bronfenbrennerôs Ecological System Theory (Bronfenbrenners, 1988). This finding suggested that, a family as a component of microsystem and mesosystem has ecological powers to determine behaviours of the individual hosted into the familyôs ecological system. Also, through mesosystems in the context of Bronfenbrennerôs

ecological system theory, the family has social power to influence the behaviours of the individual students in secondary schoolôs microsystems. Therefore, in the perspective of Bronfenbrennerôs Ecological Systems Theory, the findings are valid and reliable. Also, the findings implied that, the microsystem variable such as social supportive socialization process in family systems is a significant determinant variable that can influence facilitation or barrier to adoption of preventive behaviours against HIV infection among secondary school students in Njombe region.

In the framework of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988), the family and school proactively, directly provide preventive education to its members such that they can independently combat psychological problems such as alcoholism that lead to HIV infection, before it arise. The contents of the preventive education includes: Life skills, preventive behaviours against HIV infection, decision making skills, competence skills and reproductive health knowledge (Lewis *et al.,* 2003; Nelson-Jones, 2004).

Also, skills empower the school and family as component of the community to correctly determine the process of adoption of preventive behaviours against HIV infection among adolescents including secondary school students in Njombe region. Therefore, findings of this study indicated a new idea about cooperation between school and family microsystems and mesosystems in the process of determining adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. In the context of this study, the findings can be used to use families to increase process of adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania.

5.2.2.3 Receiving Social Supportive Socialization in Church/ Mosque Systems

Social supportive socialization process in Faith Based Organization systems was statistically confirmed to be a significant microsystem variable that determined process of adoption of preventive behaviours against HIV infection in secondary schools, in Njombe region. The church and mosque are faith based organizations that provide spiritual based teaching, learning, socialization, guidance and counselling to the believers guided by the Holly Bible and Holly Quranôs knowledge as reported by other studies (Aletha *et al*., 2010; Chacha *et al.,* 2005; Kyomo, 1977; Majeed *et al*., 2010; Schaefer, 2011).

On the basis of interpretation based on theory, in the context of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988), religious faith based socialization is delivered in Microsystems such as Churches and Mosques. Also, guided by microsystems and mesosystemôs ecological variable, faith based socialization is provided in church ,mosque, schools, families, peer groups, work place and child care centres as supported by other studies (Amoako-Agyeman, 2012; Bronfenbrenner, 1988; Chacha *et al.,* 2005; Schaefer, 2011; Shaw & Elbassel,2014).

This study explored whether or not socialization process in a Church or Mosque faith based organizations determined process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The findings of this study indicated significant support of socialization process in a Church and Mosque systems, determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region.

Most respondents accepted social supportive socialization process in Church and Mosque systems variable. Hence, these results confirmed that social supportive socialization in Church and Mosque systems is a significant variable that can determine to facilitate or hinder adoption of preventive behaviours such as sexual abstinence against HIV infection, among secondary school students in Njombe region, Tanzania.

In addition, the findings of this study significantly complied with results of other studies already reported into the published literatures (Chacha *et al.,* 2005; Kyomo, 1977). As faith based institutions, socialization process in church and mosque systems enhanced the adolescents including secondary school students to adopt preventive knowledge, skills, attitudes and behaviours that enhanced prevention of HIV infection in the church, mosque, school, families and peer groups. Consequently, the church and mosque as components of microsystems, have been confirmed as important determinant that can enhance or hinder adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, and vice versa. For example, both the church and mosque as faith based socialization microsystems has approved and recommended sexual abstinence as a preventive behaviour that can be adopted by their believers against HIV infection in schools and outside school settings.

On contrary, the church and mosque faith based socialization microsystems have used their spiritual divine powers to prohibit their believers that, they should not adopt condom use as preventive behaviours against HIV infection among adolescents including secondary school students in various countries including

Tanzania as reported in research findings already published in the literature as supported by previous studies (Aletha *et al.,* 2010; Mantell *et al.,* 2011; Majeed *et al.,*2010; Tarkang, 2014a; UNESCO,2001). Therefore, the socialization process conducted in church and mosque systems is powerful such that can determine or reject a particular preventive behaviour against HIV infection among secondary school students in Njombe region, Tanzania. Moreover, social supportive socialization in church and mosque systems has been reported into the published literatures that it facilitated the adolescents to adopt the ethical and spiritual variables which enhanced adoption of preventive behaviours against HIV infection among secondary school students.

The church and mosque instilled into the mind of adolescents approved religious spiritual beliefs, morals, values, norms, obedient, conformity, cooperation and unity among believers of different historical backgrounds. Also, the Faith Based Organisation, insist practice of forgiveness, adherence to the ten commandments, adherence to good code of dressing, kindness and adherence to preventive behaviours against HIV infection in church, mosque, school, peer groups and family microsystems as supported by previous findings (Chacha *et al.,* 2005; Kendall, 2008; Kyomo, 1997; Musiimenta, 2012; Noden *et al.,* 2010; Schaefer, 2011). The religious spiritual based behaviours instilled by the church and mosqueôs socialization process enhanced the process of adoption of preventive behaviours against HIV infection among secondary school students in various ecological settings.

Therefore, the findings of this study lead to conclude that, social supportive socialization process in church and mosque systems is a significant determinant

process such that it can facilitate or hinder the process of adoption of preventive behaviours such as sexual abstinence against HIV infection among secondary school students in Njombe region. Similarly, faith based institutions such as the church and mosque teach, guide and provide spiritual socialization, prepare individuals for good spiritual life for the present life on the physical earth and the spiritual life after death, based on Holly Bible and Holly Quranôs knowledge.

In the framework of spiritual practices adolescents including secondary school students are enhanced to practice and perform spiritual behaviours such as sexual abstinence, forgiveness, obedience, respect authorities, trustworthiness, love, truth, wisdom, discipline, conformity to moral behaviours, genuineness, confidentiality, good self-efficacy, empathy, sympathy and strong adherence to the ten commandments (Chacha *et al.,* 2005; Kiura *et al.,*1999). Therefore, the findings of this study confirmed that, on the basis of spiritual characteristics, supportive socialization process in church or mosque systems is a statistically significant determinant that can facilitate or hinder adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Furthermore, the findings of the present study complied with the results reported in other studies. A study conducted on Ambivalence, silence and gender differences in church leaderôs HIV prevention messages to young people in Kwazulu-Natal, South Africa, reported that, the church leaders and congregation members faced challenges with regards to breaking the silence on AIDS to ensure transparent communication about HIV and AIDS prevention in the church faith based organization. Also, another challenge reported was, whose responsibility it was to educate the young

people about talking sexuality in public, pre marital sexual abstinence and condom use. Thus, this finding complied with the findings of the present study that the church or mosque is a significant determinant variable to facilitate or hinder adoption of some preventive behaviours against HIV infection among adolescents in secondary school students in Kwazulu Natal as well as in Tanzania as supported by (Erikson, Lindmark, Axemo, Haddad & Ahlberg, 2010).

Similarly, a study, conducted on adolescentsô religiosity and attitudes to HIV and AIDS in Ghana, reported that, there was high level significant correlation between individualôs religiosity and adoption of type of favourable preventive behaviours against HIV infection among secondary school adolescents in Ghana. Adolescents with high religiosity, mostly adopted abstinence from sexual practices as acceptable preventive behaviours against HIV infection among adolescents in secondary schools in Ghana and vice versa (Amoako-Agyeman, 2012). Another study reported that, increased religiosity was significantly associated with practices of lower level of HIV risk sexual behaviours (Shaw & El-Bassel, 2014) Thus, these findings of the present study comply with previous studies. Also, these findings can be used in reality to activate the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

In Tanzania, a study conducted in Arusha city, found out that, the uptake of VCTôs services was significantly predicted by religiosity of the individual secondary school student ($P. < 0.001$). The findings of the study indicated studentôs high awareness, 93.5% (N=400) about VCT services. However, only 29.3% (N=400) students had ever used VCT services. The main determinant factor of adopting VCT services was

reported to be religiosity of the clients students of secondary schools (Sanga *et al.,* 2015). Hence, the findings of other studies mostly complied with results of the present study, that socialization process in church or mosque systems is a significant determinant variable that facilitated or hindered adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Thus, the findings of this study qualified to be valid, reliable and of acceptable information.

In addition, the findings of the present study complied with findings of another study, conducted in Kwazulu Natal, South Africa. This study reported that to enhance HIV prevention programmes the faith religious leaders performed the following HIV prevention activities: Advocated and preached that the church was the main credible source of HIV preventive education against HIV infection; sexual abstinence was the main correct, valid, reliable and trusted HIV preventive behaviour that ought to be adopted by the Christian youth in and outside schools in Kwazulu Natal, South Africa (Erikson, 2011)

Also, the church increased youthôs perception and consciousness that they are susceptable to HIV infection. Consequently the youth were requested to increase level of the adoption of the preventive behaviours such as sexual abstinence, against HIV infection among youth in and out of school settings in Kwazulu-Natal, South Africa. Also, the youth were engaged in physical exercises such as sports, consequently, they reduced libido level and urge for sexuality practices. Ethical dressing among female and male adolescents to control their libido level among the youth in and out of schools settings was emphasized by faith based institutions and leaders.

Lastly, the youth were requested to remain faithful across their lifespan to avoid HIV infection (Erikson, 2011). Therefore, these findings of the past study comply and confirm the findings of the present study that the church or mosque socialization process is a significant determinant factor that can facilitate or prohibit adoption of preventive behaviours according to their religious beliefs on a particular preventive behaviour against HIV infection among secondary school students in Njombe region, Tanzania.

In addition, another study that its findings complied with the results of the present study was conducted in Uganda among Christian youth in Wakiso District. The findings of this study reported that, variation of religiosity levels was significantly associated with levels of adoption of preventive behaviours against HIV infection among Christian youth in and outside schools in Wakiso District, Uganda. Lower religiosity behaviour was found to associate with higher HIV infection rates among both inside and outside of school Christian youth in Wakiso District, Uganda. On contrary, higher religiosity behaviours was positively correlated with lower HIV infection rates among both inside and outside of school among Christianôs youth in Wakiso District, Uganda.

Higher levels of religiosity were significantly associated with lower level of HIV infection rates among youth inside and outside of schools among Christianôs youth in Uganda and vice versa (Kagimu *et al.,* 2012). Therefore, these findings implied that, religiosity levels including socialization process in church or mosque systems is a strong determinant of the process of adoption of preventive behaviours against HIV infection among secondary school students in Wakiso District, Uganda.

Moreover, another study that its findings complied with results of the present study was conducted in Uganda among Muslim youth in Wakiso District. The findings of another study indicated that: respondentôs Muslim youth with high level of Islamic religiosity adopted preventive behaviours against HIV infection such as sexual abstinence, avoided alcoholism use and avoided use of Narcotic. Female youth weared long dress and avoided drinking alcohol.

These findings indicated that, religiosity behaviours adopted through Muslimsô mosque determined process of adoption of preventive behaviours against HIV infection among Muslims youth in Wakiso District, Uganda (Kagimu *et al.,* 2014). Therefore, these previous findings complied with the findings of the present study that social supportive socialization in church or mosque is a significant microsystem variable determinant that facilitates or hinder level of adoption of particular preventive behaviours such as avoiding alcoholism use among secondary school students in Wakiso District, Uganda as well as youth in secondary schools in Njombe region, Tanzania.

Similarly, a study that its findings complied with results of the present study was conducted at Limpopo province in South Africa. The findings reported that, the church used the Holly Bible knowledge to provide to her believers the following HIV prevention education services; spiritual guidance and counselling by using VCT services, healing spiritual services, prayers services used theological knowledge to reinforce abstinence from sexual practices, insisted adherence to moral beliefs and faithfulness, discouraged risk traditional initiation rites ceremonies that involved female genital mutilation to prevent HIV infection, encouraged Christians youth to

perform drama that persuaded the youth to practice preventive education against HIV infection among the youth. Also, the church encouraged cooperation and networking services between the microsystems components such as the church, schools, family, peer group and health care centres as working place (Moswane, 2013).

Thus, these findings of the other studies, reported in the literature, complied with the findings of the present study. That, social supportive socializations process in church or mosque systems is a significant microsystem variable that can determine facilitation or hinder the process of adoption of preventive behaviours against HIV infection among secondary school students in Limpopo province, South Africa as well as Njombe region, Tanzania. In addition, other previous studies that its findings complied with results of the present study, on impact of socialization process in church or mosque systems as determinant of adoption of preventive behaviours against HIV infection among adolescents including secondary school students includes the following (Mpofu *et al.,* 2014; Noden *et al.,* 2010; Tenibiaje, 2010). In the perspective of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988) these findings complied well with the functions of this Theory. The church and mosque are components of microsystem variables.

The findings of this study confirmed significant powers of the church and mosque as determinant of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. This finding has confirmed the ecological power of the church and mosque in changing the behaviour of the individuals leading to determine process of adoption of preventive behaviours

against HIV infection among secondary school students in Njombe region. That, sharing quantitative research approach was the main cause of consistent findings of this study and previous studies reported into the previous literatures.

The quantitative research approach insists validity and reliability of tools of data collection and findings of the study. Thus, similarity of quantitative research approach used in this study and other related studies is the main factor contributed to consistent findings of this study and other previous studies such as (Kagimu *et al.,* 2014). Another previous studies that are consistent with the findings of the present study included (Kitula *et al.,* 2014; Moore *et al.,* 2005; Mpofu *et al.,*2014; shaw *et al.,* 2014; Tarkang, 2014 b). Therefore, the findings of this study enhanced the conclusion that, there is a statistically significant relationship between microsystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

5.2.2.4 Receiving Social Supportive Counselling in Health Care Systems

Health care systems refer to connections of health institutions that are composed of hospitals, dispensaries, pharmacies and laboratories. These institutions jointly provide health services to combat HIV infection among clients including secondary school students (Biswalo, 1996; Lugoe, 1996). Tanzania has decentralised and liberalised health care systems which allow both public and privately owned health facilities to operate and deliver health services in Njombe region, Tanzania. The health care systems seriously emphasize adoption of health preventive behaviours against HIV infection in schools and outside schools to rescue the young people against HIV infection. The health care systems use treatment, teaching, counselling

and advocacy methods to deliver primary, secondary and tertiary prevention services against HIV infection among secondary schools students in Njombe region, Tanzania (Biswalo, 1996; Dalton *et al.,* 2007; Lewis *et al.,* 2003; Lugoe, 1996).

In addition, the health care system emphasize prevention services against HIV infection, because in clinical services, prevention is cheap, easy, friendly and use little time to combat the problem, than cure. In the efforts to combat HIV infection the health care systems deliver preventive knowledge against HIV infection. The health care systems use treatment, teaching and counselling to encourage students to avoid HIV risk behaviours such as use of alcoholism and drug abuse (.Mbatia *et al.,* 1996; Taylor, 2003). At the same time, the health care systems encouraged students to adopt HIV preventive behaviours such as attending VCT services, testing for antibodies, testing blood and blood products before transfusion (Biswalo, 1996; Lugoe, 1996;).

The main reason for consistent findings was that, interpretation based on research methodology, both studies (Lugoe, 1996) and this study used similar sample of secondary school students. As a result emerged consistent findings between this study and the findings reported by (Biswalo, 1996; Lugoe 1996). Moreover, the findings of this study for most respondents significantly supported that, receiving social supportive counselling in health care systems, determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. These findings confirmed the important powers of the health care systems in determination on adoption of preventive behaviours against HIV infection among secondary school students in microsystems in Njombe region, Tanzania.

Furthermore, interpretation based on theory, in the context of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988), the findings of this study indicated conformity with Bronfenbrennerôs Ecological Systems Theory. That, social supportive counselling in health care systems was a component of the microsystem and has ecological power to influence clients into the microsystem and mesosystems. As a result findings in this study indicated that, counselling in health care systems; significantly have ecological power to determine adoption of preventive behaviours against HIV infection among secondary school students in Njombe region.

Compliance with the Bronfenbrennerôs Ecological Systems Theory, indicated validity and reliability of findings of this study. Thus, these findings can be used in reality in the struggle to increase adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. The findings of the present study were on line with findings of previous studies (NBS-Tanzania *et al.,* 2011; TACAIDS *et al.,* 2005; TACAIDS *et al.,* 2008). Therefore, these findings lead to conclude that, there is a statistically significant relationship between microsystems variable and adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania.

5.2.3 Exosystem Variable Influenced Adoption of Preventive Behaviours against HIV Infection among Secondary School Students in Njombe Region, Tanzania

The third hypothesis predicted that, there was no statistically significant relationship between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. However,

the statistical findings of this study indicated that, there was statistically significant relationship between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The findings indicated that, the main specific significant items of exosystem variable were accessibility to message of television, radio and print media, as discussed in the next sections:

5.2.3.1 Accessibility to Television's Message Influenced Adoption of Preventive Behaviours against HIV Infection among Secondary School Students

Accessibility to televisionôs message was confirmed to be a significant exosystem variable that can determine process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Television is an electronic communication machine which transmit electro-signal message from the sender through the channel to many receivers in a very rapid speed. The findings of the present study are supported by findings of previous studies (Bertrand & Anhang, 2006; Donkor, 2014; Myers, 2008). The consistency of findings of this study and previous findings means correctness of the findings of the present study. Television is a medium of communication used to educate, inform and entertain the audience. Thus, television can be used to socialize the audience to adopt the preventive behaviours against HIV infection in Njombe region.

As a powerful medium of communication, television has been reported to transmit large quantity of message, rapidly, use actualities of sound and pictures and use attractive humour speech to capture the audienceôs perception and attitudes. In the perspective of Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner,

1988), television and other variables of exosystem, have ecological power to indirectly influence the personôs behaviours hosted into the microsystem such as family, school, peer group, church, mosque and work place. Thus, interpretation based on theory, indicated that, the findings of this study are correct and comply well with the approved theory, that is, The Bronfenbrennerôs Ecological Systems Theory. This theory guided the analysis, interpretation and discussion of this study. The compliance of the findings of this study with The Bronfenbrennerôs Ecological Systems Theory, justify the correctness of the findings of this study. These findings imply that accessibility to television message is recommended to be used in the struggle to combat HIV infection in secondary school microsystem in Njombe region, Tanzania as supported by (Bankole *et al.,*2006; Oladepo *et al.,* 2011; Omage ,2013 ; Sanga *et al.,*2015).

In addition, this study synthesized whether or not accessibility to televisionôs message determined adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. The findings of this study significantly verified that, accessibility to televisionôs message determined by facilitation of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Most respondents supported the accessibility to televisionôs message as significant determinant of either facilitating or hindering the adoption of preventive behaviours against HIV infection among secondary school students.

Therefore, these findings confirmed that, as exosystem variable, accessibility to televisionôs message is a significant variable that can determine to enhance or inhibit

adoption of preventive behaviours such as adherence to sexual abstinence, avoiding alcoholism and attendance to VCT services, against HIV infection among secondary school students in Njombe region, Tanzania. Similarly, the findings of this study, significantly complied with results of other studies that were reported into the published literatures (Franzoi, 2000; Horowitz *et al.,* 1995; Myers, 2008). That, as a component of exosystem variable (Bronfenbrenner, 1988), television has been reported into the literatures to posses strong qualities that enhance the television to attract most audience, including secondary school adolescents, compared to other mass media. HIV infection among adolescents; use attractive humour speech, use attractive colours.

Television as a medium of communication has been credited to transmit its message at very rapid speed; send large quantity of message such as preventive behaviours against HIV infection, to capture audienceôs attention and concentration. Also, televisionôs transmission of message attach concrete actualities in sound, verbal words, pictures, attractive cartoons and attractive graphic words to attract the audiences (Myers, 2008).Also, unlike other mass media, television as a component of exosystem, generate and transmit message that are clear, understandable, convincing, persuasive, attractive, compelling, repetition of message, systematic presentation of message and use two or more language in broadcasting television programmes such as Kiswahili and English to capture more audience.

Also, television transmit message that contain fluency of the communicator, believability, trustability, familiarity and penetrate into the communityôs culture. Credibility of the message and television entails operation and transmission business

for twenty four hours. Again, television transmission of message use powerful speech that is broadcasting rapidly, punctually in various styles to improve credibility, validity and reliability of the televisionôs channels and messages such that attract more audiences including young people in secondary schools in Njombe region, Tanzania.

Moreover, televisionôs transmission of message attract more audience particularly adolescents including secondary school students in Njombe region. Therefore, these findings suggested that, accessibility to televisionôs message as a component of exosystem variables, significantly can determine either promotion or hindering adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. In addition, the findings of this study complied with the outcomes of other studies reported in the literatures. A study conducted in schools in Nigeria reported that mass media including television were the most determinant that promoted adoption of sexual abstinence among in school adolescents in Western Nigeria city. Also, mass media, including television, enhanced adoption of HIV prevention education among secondary school students in Nigeria. Female youth abstained sexual practices by 98% while male students abstained sexual practices by 79% (Oladepo *et al.,* 2011).

In Tanzania a study conducted in Arusha city, in secondary schools reported that, television was the main source of information about VCT services among secondary school students by 85.3% (N=400) (Sanga *et al.,* 2015). A study conducted in schools in Iran, reported supportive findings that, television was discovered as the main source of information about HIV prevention and AIDS among secondary

school students in Iran (Tavoosi et al., 2004). The present findings complied with the results published in the literatures. The findings confirmed that the findings of the present study were correct and acceptable information.

Therefore, the findings of this study implied that, accessibility to televisionôs message is a significant exosystem variable that either promote or hinder the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Also, interpretation related to previous findings indicated that, the findings of this study are valid and reliable. The reasons for complied findings relate to shared research methodology. Quantitative research approach insists use of reliable tools of data collection and findings. Thus, these findings are recommended for application in reality practise in delivering preventive behaviours against HIV infection among secondary school student in Njombe region, Tanzania.

Similarly, the findings of this study complied with a study conducted in developing countries about effectiveness of mass media in changing behaviours of young people, found out that, mass media such as television was effective in increasing youthôs self-efficacy on sexual abstinence, delayed age of sexual debut, decreasing number of sexual partners and increasing level of adoption of preventive knowledge about HIV transmission among young people including secondary school students in developing countries as reported by (Bertrand & Anhang, 2006).

These findings complied with report of a study conducted in Ibadan, Nigeria that mass media particularly television, significantly promoted uptake of HIV counselling and testing services among young persons in Ibadan, Nigeria (Ajuwon *et*

al., 2011). Thus, the findings of the present study qualify to be correct and television can be used to activate adoption of preventive behaviours against HIV infection among secondary school students in Tanzania.

Likewise, the findings of this study, complied with a study conducted in America, reported that, culturally tailed mass media such as television and radio message delivered consistently for longer duration indicated power to access large population of audience of HIV risk adolescents. Also, television and radio media indicated to have power to reduce HIV associated risk behaviours such as alcoholism and drug abuse among adolescents including secondary school students (Horne *et al.,* 2008).

Furthermore, another study reported supportive results that mass media including television, radio and news papers enhanced acquiring changes in adoption of preventive knowledge, attitudes and behaviour practice against HIV infection into the community of secondary schools (Wakefield, loken & Hornik, 2009). Again, a study conducted in the school of Luck now, India, found out that, television was the main source of preventive information about HIV/AIDS transmission and prevention among secondary school students by 85% (N= 215) (Gupta, Anjum, Bhardwaji, Srivastav & Zaidi, 2013).

In addition, another study which its findings support the present study, was conducted in AdoEkit, South Western Nigeria. This study found out that, HIV/AIDS was most known to secondary school students in South Western Nigeria by 78.0% (n=499). Electronic media including television was one of the main sources of preventive information about HIV/AIDS and other sexual transmitted infections

(STI) by 68.7% (Amu & Adegun, 2015).

Another supporting study conducted in Ghana found out that, mass media including television was most used for enhancing communication about HIV/AIDS modes of transmission, prevention and associated stigma among young women in and out of schools in Ghana (Asamoah, *et al.,* 2017). These findings complied with a study conducted among African American adolescents and reported that culturally sensitive mass media programmes including television had potential powers to achieve more significant and stable reduction of sexual risk behaviours among African American adolescents (Sznitman, *et al.,* 2011). Other studies that its findings complied to findings of this study included (Bleakley *et al.,* 2008; Evans *et al.,* 2012; Martino *et al.,* 2009; Thanavah *et al.,* 2013).

The findings of other studies significantly complied and supported the findings of the present study. The compliaceability of the previous and present study findings indicated that, the findings of this study are correct and are of acceptable quality status. The findings of this study was consistent with findings of previous studies, because of using similar research methodology, specifically, quantitative research approach. Therefore, these findings suggested that accessibility to televisions message is a significant determinant exosystem variable that can either promote or hinder the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Thus, the quality of the finding of this study attracted recommendation that, they should be used in practical process of promoting adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Moreover, other studies that its findings support significant socialization powers of televisionôs message to determine process of adoption of preventive behaviours against HIV infection among secondary school students, includes (Aylikci *et al.,* 2013; Asekun-Olarinmoye *et al.,* 2011; Bankole et al ., 2008; Bleaky *et al.,* 2009; Evans *et al.,* 2012; Kofi *et al.,* 2014; Majeed *et al.,* 2010; Mlingo, 2008; Odusanya *et al.,* 2006; Omage, 2013; Ojieabu *et al.,* 2008; Rosengard *et al.,* 2012; Thanavanh *et al.,* 2013).

5.2.3.2 Accessibility to Radio's Message Influenced Adoption of Preventive Behaviours against HIV Infection among Secondary School Students

Accessibility to radioôs message was confirmed to be statistically significant exosystem variable that could determine process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Radio is a universal medium of communication that transmit electrical signal message of sound in a rapid speed from the sender to many receivers.

Radio broadcasting focus to educate, inform, entertain and persuade the audiences in favour of the communityôs values, norms, beliefs and entire culture as reported by (Mcleish,1994).Radio broadcasting use humour sounds, systematic varieties of voices, rapid speed of transmission of message, large quantity of electronic message accompanied with music to attract large number of audiences (Mcleish, 1994).

In addition, radio broadcasting can access a large number of audiences including listeners in urban as well as those in local remote areas. Radio message is cheap to access, easier to access, plenty to access than other mass media medium of

communication. Also, radio as a broadcasting device is cheap to purchase, cheap to maintain, easier to operate, cheap running cost, portable, durable and use little electrical energy compared to other mass media.

Radio broadcasting use National and International language such as Kiswahili or English such that most audience can capture, interpret, understand and use the radioôs message to shape their behaviours and attitude including adoption of preventive behaviours against HIV infection among secondary school students as supported by (Bankole *et al.,* 2008; Lugoe, 1996; Mcleish, 1994; Nwimo, *et al.,* 2007; Odusanya *et al.,* 2006; UNESCO, 2001).

Moreover, radio broadcasting creates imagination pictures into the mind of the listeners such as young people in secondary schools. Unlike Televisionôs broadcasting which transmit separately wordôs message and image of pictures, on contrary, radio broadcasting integrated an imaginary pictures into the electrical signal of words messages (Mcleish, 1994). The radio announcer carefully selects strong creative and attractive words that deliver wordsôsignal and imaginary pictures into the audienceôs mind. Radio use sound effects of actuality materials. As a result, radioôs message become understandable, convincing, interesting, and attractive and attracts more audiences, compared to other mass media (Mcleish, 1994).

In addition, rapid speed of radio transmission of message in form of electrical signal, from the sender to receivers, is another characteristic of radio, compared to other mass media. Radio transmission of message in form of electrical signal is immediate, punctual, rapid speed and flexible. Consequently, radioôs receiving and

dissemination of information to the audiences is immediate within a short duration of time compared to other mass media. Radio message can be easily received, processed and send to receivers through broadcasting rapidly compared to other mass media. Thus, on the basis of these radioôs characteristics and as a component of exosystem variable, accessibility to radio message can significantly determine by promotion or hindering level of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Moreover, integration of radio broadcasting and music is another credible characteristic that empower the radioôs transmission compared to other mass media. Radio broadcasting use music to entertain, attract and sustain the audiences. For example, radio uses sign tune to introduce and fade out each programme. Also, short insert of music are inserted into the programme to sustain the audience throughout the programme. As a result, the radio broadcasting manages to deliver education, information and entertainment to the audiences. These are the core function of any mass media structure. In radio broadcastings music provide pleasantness, relaxation, pleasure and excitement to the audiences.

Hence, these characteristics of radio broadcasting attached with music as a component of exosystem significantly determine process of adoption of preventive behaviours such as use of VCT services against HIV infection among secondary school students in Njombe region. Moreover, the findings of this study complied with the results of other studies. A study conducted in Western Nigeria reported that, mass media including radio were the most determinant variable that promoted adoption of sexual abstinence among in school adolescents in Western Nigerian city

(Oledepo, *et al.,* 2011).

Another supporting study, conducted in Arusha, Tanzania, found radio broadcasting as a source of information and it contributed to preventive information about VCT uptake by 65% (Sanga, *et al.,* 2015). Also, a study conducted in Ibadan, Nigeria, revealed that, mass media including radio promotion programmes enhanced uptake of HIV counselling and testing services among young people include secondary school students (Ajuwon *et al.,* 2011).

A study conducted in developing countries revealed that, radio as a component of mass media in exosystems variable, effectively enhanced HIV interventions leading to increased preventive knowledge about HIV transmissions and prevention methods improved self efficacy about condom use, sexual abstinence, delaying age of sexual debut and increased amount of interpersonal communication skills about HIV prevention methods among the audiences particularly the youth in and outside schools in developing countries (Bertrand *et al.,* 2006). Moreover, other studies that its findings complied with the results of this study, with regard to contribution of radio programmes to determine adoption of preventive behaviours against HIV infection among youth included (Amu *et al.,* 2015; Asamoah *et al.,* 2017; Horner *et al.,* 2008; Sznitman *et al.,* 2011 & Wakefield *et al.,* 2009).

Interpretation related to previous research implies that, compliancebility between findings of various studies and the findings of this study confirmed the correctness and acceptability of the findings of the present study. Hence, these findings of the present study suggests that, accessibility to radioôs message as component of

exosystem variable, has power to significantly determine to either promote or hinder process on adoption of preventive behaviours such as attending VCT services, against HIV infection among secondary school students in Njombe region, Tanzania. Thus, this study suggested that accessibility to radio message to be increased to promote use of preventive behaviours against HIV infection in secondary school microsystems in Njombe region, Tanzania.

Likewise, interpretation based on theory, the findings of this study indicated that in the perspective of Bronfenbrennerôs Ecological System Theory (Bronfenbrenner, 1988) the findings of this study in relation to accessibility to radioôs message variable, significantly complied well with Bronfenbrennerôs Ecological Systems Theory. The findings suggested that, radio as a component of exosystem variable has been confirmed to possess determinant ecological power to either promote or hinder the adoption of preventive behaviours such as avoiding alcoholism risk behaviours against HIV infection at microsystem level such as school, family, mosque, church and peer group.

Radio broadcasting programmes are powerful tools to facilitate advocacy in favour of clientôs hosted in ecological systems, as documented into the Bronfenbrennerôs Ecological System Theory (Bronfenbrenner, 1988). Radio can transmit large quantity of information from exosystem to microsystems leading to educate, inform, entertainment and persuade such that individuals including secondary school students increase level of adoption of preventive behaviours against HIV infection among young people, including secondary school students in Njombe region, Tanzania. This finding is recommended to be applied in reality in the process of

promoting increasing uptake of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Similarly, other studies whose findings comply with findings of this study about socialization forces of radio media to determine process of adoption of preventive behaviours against HIV infection among youth is secondary schools, includes the following (Bamise *et al.,* 2011; Bankole *et al.,* 2008; Davhana ï Maselesele *et al.,* 2007; Delgado *et al.,* 2007; Majeed *et al.,* 2010; Ghasem *et al.,*2013; Ghojavand et al ., 2013; Limaye *et al.,* 2013; Mlingo, 2008; Nwimo *et al.,* 2007; Odusanya, *et al.,* 2006; Ojiebu *et al.,* 2008; Thanavanh *et al.,*2013; UNESCO, 2001). These consistencies of findings between studies verify and indicate correctness quality of the findings of this report.

Moreover, consistency of findings of this study means these findings can be used in practical reality to activate the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The consistency of findings between studies is attributed to the use of similar research methods. Such as quantitative research approach which insist reliability of tools of data collection and findings of the study. However, this study was designed as correlational research. Thus, its findings do not mean causation of independent variable on dependent variable of this study.

5.2.3.3 Accessibility to Print Media's Message Influenced Adoption of Preventive Behaviours against HIV Infection among Secondary School Students

Accessibility to print mediaôs message was statistically confirmed to be an

exosystem variable that determined process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. The print mediaôs means mass media which transmit information from the sender to the receiver audiences through printed words, numbers, pictures and graphs. Also, print media refers to printed news papers, magazines, newsletters, journals, leaflets and bronchures (Giddens *et al.,* 2012; Macionis, 1999; Robertson, 1998).

In addition, this study examined and confirmed the contribution of accessibility to print mediaôs message as a component of exosystem to determine adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Also, results of the present study indicated that, most respondents supported the accessibility to print mediaôs message as a significant determinant variable, that determine adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Therefore, the findings of this study, confirmed that accessibility to print mediaôs message was a significant exosystem variable that determined to either promote or hinder the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Similarly, the print mass media have been reported in the published literatures (Bamise *et al.,* 2o11; Bankole *et al.,* 2008) to possess quality characteristics that enhance the printed media to determine process of adoption of preventive behaviours against HIV infection among secondary school students in various settings. Print mass media are portable to transfer from the printer to the readers. The print mass media have ample and big space to accommodate most information, have varieties of

information including HIV preventive behaviours against HIV infection. As reported by other studies (Majeed *et al.,* 2010; Nwimo *et al.,* 2007).

In addition, the findings of this study and previous studies indicated that, print mass media are easier to preserve for future reference, use still pictures that are cheap to produce and attract clients including secondary school students; availability for longer time such that the readers can access the information for longer time, compared to electronic media such as television which its information are accessed for short time.

Also, the previous findings comply to present finding and jointly indicated that, print mass media such as newspapers are cheap to produce compared to other media such as television programmes, cheap to buy, cheap to run, cheap to distribute from the publisher to the receivers; attractive with coloured prints and pictures; use National languages leading to enhance accessibility among most receivers. Again, this finding indicated that, print media have quality of using International language such as English or National language such as Kiswahili leading to attract most readers, citizens and foreigners among secondary school students in Njombe region, as supported by (Davhana-Maselesele *et al.,* 2007; Lugoe, 1996).

Likewise, this finding indicated that, print media, displayed important information on the front page with large headline titles, attractive colours and large font size. Lastly, the finding indicated that, print media use actualities to instil naturalness of information which enhance the print media to educate, inform, entertain and persuade the clients including secondary school students in Njombe region,

Tanzania. These qualities of the print media enhance the media to send large quantity of information to most readers including the secondary school students in Njombe region, Tanzania. Hence, the findings of this study confirmed and suggested that, accessibility to print mediaôs message as a component of exosystem variables, significantly determined to either promote or hinder the process of adoption of preventive behaviours such as avoiding alcoholism behaviour, against HIV infection among secondary school students in Njombe region, Tanzania.

Furthermore, the findings of this study complied with the results reported in other previous studies about the print media as a determinant of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. A study conducted in America reported that, magazine and News papers media have power to access a large population of the audience of HIV risk adolescents. Also, magazine and newspapers supported preventive changes in HIV preventive beliefs and reduced HIV- associated risk behaviours among adolescents as reported by (Horner *et al.,* 2008).

Another study on mass media campaign, and its findings comply to findings of the present study reported that, the media including news papers, television and radio produced positive increased changes in acquiring preventive knowledge, attitudes and behaviour practice against HIV infection into the community including secondary schools, across large populations in the World (Wakefield, et al., 2009). Also, a study conducted in Iran found out that, news papers and magazines were main sources of preventive information against HIV infection and AIDS among secondary school students in Iran (Tavoosi *et al.,* 2004). A study conducted in south

western Nigeria, found out that print media were among the main sources of preventive information against HIV infection. Print media contributed 44.9 % of preventive information to the secondary school students in Ado Ekiti, South Western Nigeria (Amu *et al.,* 2015).

Moreover, other studies that its findings complied with the results of this study, that newspaper and magazine were source of preventive education and determine adoption of preventive behaviours among secondary school students included (Davhana-Maselesele *et al.,* 2007; Nubed *et al.,* 2016). Complianceability between findings of various studies and findings of this study, confirmed correctness and acceptability of the findings of this study. Therefore, these findings confirmed that, accessibility to print mediaגs message was a significant determinant exosystems variable that either promote or inhibit adoption of preventive behaviours against HIV infection among secondary school students in various schools including those in Njombe region, Tanzania.

In addition, interpretation in relation to previous research, indicated compliancebility between findings of the present study and previous studies verify the validity and reliability of these findings. Thus, these findings attracted suggestion that, the findings of this study should be used in real practical exosystem. Also, print media should be used practically to promote adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Moreover, other studies which its findings support the significant correctness of the results of this study, that print media determine process of adoption of preventive behaviours against HIV infection among youth in schools, includes the following (Bamise *et*

*al.,*2011; Bankole *et al.,* 2008; Davhana-Maselesele *et al.,*2007; Majeed *et al.,* 2010; Nwimo *et al.,* 2007; Lugoe, 1996)

Similarly, interpretation in the context of the hypothesis of this study, the findings indicated that, there is statistical significant relationship between exosystem variable and adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. Also, in the context of application in reality, the finding of this study indicates that, accessibility to print mediaôs message can be used to increase process of adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region, Tanzania.

In addition, interpretation of findings of this study in the framework of theory indicated that accessibility to print mediaôs message influenced adoption of preventive behaviours against HIV infection among students, comply with The Bronfenbrennerôs Ecological Systems Theory. Thus, the findings of this study are correct and can be used to increase adoption of preventive behaviours against HIV infection among secondary schools students in microsystems. However, this study was designed as a correlational study. Thus, the findings do not mean causation of independent variable on dependent variable. These findings just indicate relationship between independent variables such as perception, microsystems, exosystems and one dependent variable such as adoption of preventive behaviours against HIV infection in schools microsystems.

5.3 Conclusion for Chapter Five

In the framework of the Bronfenbrennerôs Ecological Systems Theory

(Bronfenbrenner, 1988). Also, on the basis of the findings and discussion provided in chapter four and five of this report, it can be concluded that: Perception variables determined adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania, are: Perceived credibility of preventive knowledge against HIV infection to students; primacy effects of knowledge delivered to empower students to adopt preventive behaviours against HIV infection and perceived susceptibility to HIV infection among secondary school students in Njombe region, Tanzania. In addition, microsystem variable determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region are: Receiving social supportive socialization in schools, churches, mosques, families and counselling in health care systems.

Lastly, exosystem variable determined on adoption of preventive behaviours against HIV infection among secondary school students in Njombe region are: Accessibility to televisions, radio and print mediaôs message, influenced adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. The next chapter presents summary, conclusions, and recommendations.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents summary, conclusions and recommendations of the present study.

6.2 Summary

This study aimed to investigate, psychosocial determinants on adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania. In particular, this study was guided by three specific research objectives, namely:

(i) Examine the contribution of perception variable on adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania.

(ii) Analyse the contribution of microsystem variable on adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania.

(iii) Synthesize the contribution of exosystem variable on adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania.

In addition, this study predicted and tested three hypotheses, based on the previous studies. The study predicted that: First, there was no statistically significant relationship between perception variable and adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania.

However, the findings indicated that there was statistically significant relationship between perception variable and adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania. The main significant items of perception variable were reported to include, credibility of preventive knowledge, Susceptibility to HIV infection and primacy effects of knowledge delivered to students.

Similarly, another null hypothesis predicted that there was no statistically significant relationship between microsystem variable and adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania. However, the findings indicated that, there was statistically significant relationship between microsystem variable and adoption of preventive behaviours against HIV infection among Secondary School student in Njombe region, Tanzania.

The main items of microsystem variable accepted were schools, families, church, mosque and health care system. In addition, another hypothesis predicted that there was no statistically significant relationship between Exosystem variable and adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania. This was not the case in this study, contrary to our prediction. The findings indicated that, there was statistically significant relationship between Exosystem variable and adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania.

The main statistically accepted items of exosystem variable were accessibility to messages of television, radio and print media. Therefore, the findings of this study

indicated that perception, microsystem and exosystem variables are recommended to be used to increase the process of adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania.

Preventive behaviours indicated psychological actions and perceptions adopted by the individual to enhance proactively avoid HIV infection especially among young people in secondary school settings. The preventive behaviours included effective use of preventive knowledge against HIV infection, use of VCT services, avoiding alcoholism, avoiding drug abuse and adherence to sexual abstinence as reported by (Lewis *et al.,* 2003; Lugoe, 1996; Taylor, 2003). In addition, prevention entails proactively prediction and stopping in advance psychological problems such as alcoholism before it occurs. According to Caplan (1964) prevention is delivered and categorized into three clusters. These categories are primary prevention, secondary prevention and tertiary prevention (see also Dalton *et al.,* 2007).

Moreover, Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988), was the origin of independent variables which guided this study. The variables were perception, microsystem and exosystem variables. These variables included the factors that were subjected to statistical test to examine if they determined process of uptake of the dependent variable, the preventive behaviours against HIV infection among secondary school students in Njombe region.

Prevention psychological services were applied to proactively combat HIV infections. In the process of combating psychological problem such as alcoholism behaviour that lead to HIV infection. Prevention was preferred because it was

cheaper in monetary cost, easier to use, less intensive, use short time, friendly, use few experts and cope with scarce health experts who ought to attend the clients (see also Dalton *et al.,* 2007).

Similarly, the negative association between youthôs possession of high percentages of preventive knowledge against HIV infection versus, low uptake of preventive behaviours such as use of VCT services, adherence to sexual abstinence, avoiding alcoholism and avoiding drug abuse, triggered challenging question. What are psychosocial determinants on adoption of preventive behaviours against HIV infection among secondary school students particularly in Njombe region, Tanzania? Thus, to obtain valid and reliable answers for this question, it was imperative to conduct this study among secondary school students in Njombe region in Tanzania

In addition, this study on psychosocial determinants of preventive behaviours against HIV infection among secondary school students was significant and important. This study generated valid and reliable information on perception, microsystem and exosystem variables that regulated process of adoption of preventive behaviours such as use of VCT services against HIV infection among secondary school students in Njombe region, Tanzania.

The findings information on perception, microsystem and exosystem variables can enhance policy makers, policy implementers, academicians and researchers to evaluate and revise HIV prevention policies and programmes in primary, secondary and tertiary prevention services as founded by Caplan (1964).The revised HIV

prevention programmes could help to rescue majority of secondary school students against HIV infection in secondary school settings in Njombe region, Tanzania. Also, the findings of this study can enhance the community counsellors, teachers, parents, faith leaders, health workers and youth leaders to correctly perform their social responsibilities such that they rescue the secondary school students against HIV infection in school settings in Njombe region, Tanzania.

Moreover, the Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988), guided the analysis, interpretation, discussion and conclusions of findings of this study. This theory involve psychological perspectives that advocated for ecological systems as the most powerful determinants that shape humanôs behaviours throughout the life span (Bendt, 1997; Bronfenbrenner, 1979). The Bronfenbrennerôs Ecological Systems Theory emphasized that, individualôs behaviour was determined by the immediate ecological systems which the individual directly interact and by a broader ecological forces that indirectly determine individualôs behaviour and life styles (Bendt, 1997; Bronfenbrenner, 1988).

Similarly, Bronfenbrennerôs Ecological Systems Theory, consists of five chronologically arranged environmental systems. These environmental components are microsystems that host socialization systems such as family, school, church, mosque and peer groups. Mesosystems that imply direct interaction between Microsystemsôs; socialization systems such as school and family Exosystems, host mass mediaôs structures including television, radio and newspapers that indirectly influence behaviours of individuals hosted into the microsystems. Macrosystems; host culture, values, beliefs, ideology, philosophy and policies of the community.

Lastly, chronosystem refers individualôs sociohistorical conditions across the life span of the person depending upon time progress (Bronfenbrenner, 1979). Thus, in this study to facilitate adoption of preventive behaviours against HIV infection among secondary school students, the entire components of the Bronfenbrennerôs Ecological Systems Theory, ought to be effectively complied, in the context of secondary school settings. Bronfenbrennerôs Ecological Systems Theory, has been credited to facilitate correct understanding of the social psychological and ecological variables in relation to perception, microsystems, and, exosystem as main determinant independent variables that significantly influence the process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Also, Bronfenbrennerôs Ecological Systems Theory, emphasis social behaviour, culture and environment as the main determinants of human behaviour, including adoption of preventive behaviours against HIV infection among youth in Secondary school settings in Njombe region, Tanzania. In addition, the literatures reviewed were guided by three specific research objectives, three hypotheses and the Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988). The literature reviewed focused on perception, microsystem, exosystem independent variables, preventive behaviours against HIV infection and risk behaviours among young people in secondary schoolsôsettings.

The literatures reviewed indicated strong supportive to all alternative hypotheses. Thus, the literature reviewed supported that there was statistically significant relationship between perception, microsystem, exosystem independent variables and

process of adoption of preventive behaviours against HIV infection among Secondary School students. The dichotomy between high level of studentsô HIV preventive knowledge and low process of adoption of preventive behaviours against HIV infection among Secondary School students was the knowledge gap and justified to conduct this study.

6.3 Research Methodology

This study was designed as a cross-sectional research. This design was deployed because it attracted high participation rates among respondents, as data were collected only once (Cohen *et al.,* 2007). Also, this study was designed as a correlational research design as recommended by Franzoi (2000). Correlational research design was preferred because it enhanced analysis of level of correlation between independent variables and dependent variable (Phares, 2003). In this study, independent variables were perception, microsystems and exosystems variables while dependent variable was the adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Similarly, quantitative research approach guided this study. This research paradigm originated from positivist philosophical school of thought as advocated by Aguste Comte during the 19th century (Cohen *et al.,* 2007; Sarantakos, 1998). Quantitative research paradigm was preferred because it allowed use of inferential statistics to examine level of correlation between independent variables and dependent variable in this study. In addition, Njombe region was purposively selected as a study area of this study. Njombe region previously was part of Iringa region and recorded high HIV prevalence rates. These were 16% in 2007/08 year (TACAIDS *et al.,* 2008) and

14.8% in 2011/12 year (URT, 2014c). These HIV prevalence rates included secondary school students in Njombe region. Thus, these high HIV prevalence rates attracted the need to opt Njombe region as catchment study area for this study particularly in secondary school settings. The target population was 41072 secondary school students, aged 15-23 years in Njombe region (URT, 2014b). This study had a sample size of 1,000 secondary school students of Njombe region, Tanzania.

Probability sampling technique such as multistage sampling technique was used to select students from the target population and included into the sample of this study. Likewise, questionnaires tools of data collection was used in this study to collect data from the secondary school students with regards to perception, microsystems and exosystems independent variables determined level of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region (Appendix, A).

Similarly, this study ensured validity of the tools of data collection and the findings of this study. Validity pertained to the truth, correctness and accuracy of the tools of data collection and data collected as expected. This study ensured validity of the findings such that could respond to specific research objectives and research hypotheses of this study. This study adhered and ensured the following types of validities: contentô, construct, criterion, predictive, external and internal validities for this study as recommended by (Cohen *et al.,* 2007; Cozby, 2007 & Mcmillan, 2008).

In addition, this study ensured reliability of the tools of data collection and the findings of this study. Reliability entailed consistency, dependability, replicability,

stability and precision of instruments of data collection such as the questionnaires and findings across different times, settings and samples of respondents (Best *et al.,* 2006; Elmes *et al.,* 2012). In this study, the statistical test used to examine reliability of questionnaires as tools of data collection during pilot testing were: Pearson product moment correlation coefficient test; Spearman- Brown formula and Cronbachôs alpha coefficient, as suggested by (Cohen *et al.,* 2007; Fisher, 2010; Mcmillan, 2008).

Moreover, ethical considerations were adhered too, in this study. Ethics entailed morality standards that guided conduct of behaviours of the investigators (Frolov, 1984; Mukherji *et al.,* 2015). This study adhered to philosophical ethical principles such as autonomy, beneficence, non maleficence, justice and fidelity (Cozby, 2007; Houser, 1998). Also, this study adhered to ethics recommended by The American Psychological Association (APA) and The Tanzania Commission for Science and Technology (COSTECH) (www.costech.or.tz) such as confidentiality and seeking institutional approval to all institutions in which data collection was conducted. This, study asked institutional approval from the authorities of The Open University of Tanzania and The Region Administrative secretary, Njombe region. All these authorities allowed to conducting this study in their selected secondary schools (Appendix, H, Research clearance documents).

Similarly, this study used measurement scales and levels depending on the nature of data collected and presented in contingency tables. In this study, measurement scales used included: Nominal scales, used to measure nominal data. Also, ordinal scales were used to measure ranked data. In this study, ordinal data were collected in

summative rating Likert scales and were measured by using ordinal scales and recommended statistical test, that is, the Spearman rank order correlation coefficient test. Also, ratio scale was used in this study. It was used to measure and examine ratio data. Also, Summarization, tabulation and presentation of findings into the contingency tables and figures was performed. Data analysis and classification was carefully performed such that the findings responded well to the specific research objectives and research hypotheses of this study. Data responses were classified into four categories. First, socio demographic responses, secondly, perception variables, thirdly, microsystems variables and fourth, exosystems variables, determined process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

Similarly, in the process of data analysis and statistical procedures, this study used correlation and regression analysis techniques to examine the status of the null hypothesis that guided this study. Specifically this study used Pearson product moment correlation coefficient test (*r*), Spearman rank correlation coefficient test*(rho*), multiple correlation coefficient *(R), t- test.* Also, Multivariate regression coefficient *(R)* and multivariate logistic regression coefficient *(R)* was used in this study as recommended by (Bluman, 1998; Cohen *et al.,* 2007; Elmes *et al.,* 2012).

These statistical tests were preferred and used because they enhanced to examine and establish the following data analysis procedures: Examined, established and verified existence of significant direction, strength and relationship between independent variables such as perception, microsystem and, exosystem variables versus dependent variable such as adoption of preventive behaviours against HIV infection

among secondary school students in Njombe region, Tanzania. Also, the correlation and regression statistical tests, enhanced to examine and verify the status of the null hypotheses that guided the focus of this study.

6.4 Conclusions

Specifically, on the bases of research findings presented in chapter four and discussed in chapter five of this study. It is concluded that according to specific research objectives the main psychosocial determinants on adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania, include the following:

6.4.1 Perception Variable

First, perceived credibility of preventive knowledge against HIV infection among secondary schools students in Njombe region. These findings implied that, the validity and reliability quality of the preventive knowledge against HIV infection was determinant factor of adoption of preventive behaviours against HIV infection in schools in Njombe region. Secondly, perceived susceptibility to HIV infection among secondary school students in Njombe region. Thirdly, primacy effects of knowledge delivered to empower students to adopt preventive behaviours against HIV infection in secondary schools in Njombe region. These findings were the main perception variable determinants of process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

6.4.2 Microsystem Variable

The main findings were: First, students receiving social supportive socialization in schools systems. Secondly, students receiving social supportive socialization in

Church/Mosque systems. Thirdly, students are receiving social supportive socialization in family systems and fourth, students receiving social supportive counselling in health care systems. These findings were the main microsystem variable determinants of process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

6.4.3 Exosystem Variable

In this study, the main exosystem findings were: First, accessibility to televisionôs messages influence adoption of preventive behaviours against HIV infection among secondary schools students. Secondly, accessibility to print mediaôs message and Third, accessibility to radioôs message influence adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania. These findings were the main exosystem variable determinants of process of adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

6.5 Main Research Findings

According to specific research objectives, the main research findings include: First, perceived credibility of preventive knowledge against HIV infection among secondary schools. Second, students receiving social supportive socialization in schools**.** Third, accessibility to televisions messages influence adoption of preventive behaviours against HIV infection among secondary schools students.

6.6 Recommendations

6.6.1 Recommendations for Implementation

On the basis of the findings reported in this study, the following recommendations

deserve attention of the policy makers, policy implementers, researchers and academicians.

6.6.1.1 Policy Makers

These experts ought to adopt the Bronfenbrennerôs Ecological Systems Theory (Bronfenbrenner, 1988), in preparing valid and reliable HIV prevention policies at macrosystem level. This theory is powerful, comprehensive, valid and reliable such that can facilitate to implement effectively the HIV primary , secondary and tertiary prevention services against HIV infection among secondary schools students in Njombe region, Tanzania.

In addition, in the perspective of Bronfenbrenner Ecological Systems Theory, the policies at macrosystems level ought to guide, beliefs and functions of socialization institutions into the microsystem (school, family, church, or mosque and peer groups). Also, the HIV prevention policies should guide the socialization microsystems to cooperate and facilitate adoption of preventive behaviours against HIV infection. Again, the policies should guide the socialization institutions be structured such that they can avoid conflict of interest among the socialization microsystems. All socialization microsystems should struggle to work together and proactively strive towards combating HIV infection in schools.

6.6.1.2 Policy Implementers / Public Servants

This study recommends that, in the framework of Bronfenbrennerôs Ecological Systems Theory, policy implementers ought to develop and implement HIV primary prevention, secondary prevention and tertiary prevention intervention services as

found by (Caplan, 1964) and findings of this study, leading to proactively rescue the youth against HIV infection in secondary schools in Njombe region, Tanzania.

6.6.1.3 Researchers

In the perspective of the Bronfenbrenner Ecological Systems Theory, the researchers and academicians ought to conduct scientific evaluation research, in relation to implementation of the recommended perception, microsystems and exosystems variables that ranked high in determining adoption of preventive behaviours against HIV infection among secondary school students in Njombe region, Tanzania.

6.6.1.4 Parents of Secondary School Students

In the framework of Bronfebrennerôs Ecological systems theory and findings of this study, the microsystem such as schools, families, church and mosque should establish community counselling programmes. These programmes should provide preventive knowledge, life skills, reproductive health, and adoption of preventive behaviours against HIV infection in school and families microsystems.

6.6.1.5 Students of Secondary Schools

In the perspective of Bronfebrennerôs Ecological system theory and findings of this study, the microsystems such as peer group including sports club, and drama group should establish peer education programmes in school context. These programmes should provide preventive peer education on reproductive health, life skills, and adoption of preventive behaviours against HIV infection among Secondary School youth in schools, Peer education programmes should be provided through debates, sports, drama, poems and choirs.

6.6.2 Recommendations for Future Studies

HIV prevention in secondary schools is a broad topic that requires more scientific investigation in secondary schools in Njombe region, Tanzania to correctly understand the HIV primary, secondary and tertiary prevention process in schools microsystems. Thus, in the perspective of Bronfenbrennerós Ecological Systems Theory (Bronfenbrenner, 1988), this report recommends that, future studies should investigate on: psychosocial contribution of peer groups on adoption of preventive behaviours against HIV infection among secondary school students in school microsystems, in Tanzania.

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APENDICES

APPENDIX A: Questionnaire

Dear students, I am a PhD student of The Open University of Tanzania (OUT). I'm conducting a study on:

Psychosocial determinants on adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania:

Instructions:

(i) This questionnaire intends to collect data on the psychosocial determinants on adoption of preventive behaviours against HIV infection among Secondary school students in Njombe region, Tanzania.

(ii) Psychosocial determinants are categorized into perception, microsystem and exosystem variables.

(iii) Please youõre kindly asked to participate in this important research, to prevention of HIV infection to students in secondary schools through responding these questions.

(iv) Tick any one option only in appropriate box. You may skip any question you feel uncomfortable to respond.

(v) All information supplied will be strictly treated confidential and used for academic purposes only.

(vi) Do not write your name anywhere in this questionnaire.

(vii) The researcher will collect the completed questionnaires on or before 30/10/2016.

(viii) Thanks for your cooperation.

Section one: Socio demographic data

1. Tick your gender

   (1) Male é é é é é é . [ ] (2)Female é é é é é .....é .. [ ]

2. Tick your age group: (1) 15 ï 18 years. [ ] (2) 19-23 years. .....[ ]

3. Tick your education level: (1) Ordinary Secondary education (Form I-IV)[ ]

   (2) Advanced secondary education (Form V-VI..... ..[ ]

4. Tick your religion affiliation: (1) Christian [ ]. (2) Muslim ..... [ ]

5 Tick your schoolôs location: (1) Urban é . [ ] (2) Rural é é é ....[ ]

6 Tick school ownership (1) Public..... [ ] (2) Private..... [ ]

7 Tick composition of your school

   1) Co-education..... [ ] (2) Boys or Girls school only.....[ ]

8 Tick residences of students in this school (1) Boarding and day school... [ ]

   (2) Day school.....[ ]

Section two. Perception variable

9 Please tick ***any one*** item of **perception variable** in the following list of indicator items which you think most influence adoption of preventive behaviours against HIV infection among secondary school students in Njombe region. Studentsô perception of:

1) Perceived credibility of preventive knowledge against HIV infection among secondary school students .....[ ]
2) Perceived susceptibility to HIV infection among secondary school students..... [ ]
3) Perceived primacy effects of knowledge delivered to empower students to adopt preventive behaviours against HIV infection in secondary schools ..... [ ]
4) Perceived benefits of preventive behaviours against HIV infection among secondary school students ..... [ ]
5) Perceived life skills learning services to empower students to adopt preventive behaviours against HIV infection among secondary school students.....[ ]
6) Perceived self ï efficacy expectances preventive behaviours against HIV infection among secondary school students ..... [ ]
7) Perceived controllability of preventive behaviours against HIV infection among secondary school students..... [ ]
8) Perceived acceptability of preventive behaviours against HIV infection among secondary school students .....[ ]
9) Perceived invulnerability to HIV infection risk among secondary school students .....[ ]
10) Perceived persuasibility to adopt preventive behaviours against HIV infection among secondary school students.....[ ]

In question 10 to 25 tick ***any one*** option only to indicate level of your ranking agreement or disagreement on each **perception variable** that may influence the adoption of preventive behaviours against HIV infection among secondary school students in Njombe region.

	Perception variables that may influence adoption of preventive behaviours against HIV infection to students. Studentsô beliefs of :	Responses				
		Strongly agree	Agree	Uncertain	Disagree	Strongly
		5	4	3	2	1
10	Use of logical argument in counselling and delivering message on preventive behaviours against HIV infection					
11	Systematic repetition rate of counselling and receiving preventive message against HIV infection to students					
12	Concreteness of message delivered in advocacy to empower students to adopt preventive behaviours against HIV infection to students in secondary schools.					
13	Recency effects of knowledge delivered to empower students to adopt preventive behaviours against HIV infection					
14	Vividness of language used to communicate message on preventive behaviours against HIV infection to students					
15	Compatibility between previous knowledge and new health preventive behaviours against HIV infection to students in secondary schools					
16	Existence of intention to adopt preventive behaviours against HIV infection to students.					
17	Exposure to counselling services on preventive behaviours against HIV infection to students					
18	Attention to knowledge content on preventive behaviours against HIV infections to students.					
19	Acquisition and comprehension of knowledge on preventive behaviours against HIV infection to students.					
20	Deep synthesis of knowledge on health preventive behaviours against HIV infection to students					
21	Concentrations to counselling information on preventive behaviours against HIV infection to students					
22	Rehearsal on knowledge of preventive behaviours against HIV infection to students					
23	Consistent counselling of information on preventive behaviours against HIV infection to students					
24	Reliability quality of information on preventive behaviours against HIV infection to students					
25	Validity quality of information on preventive behaviours against HIV infection to students					

Section three: Microsystem variable

26. Please tick ***any one*** item of **Microsystem variable** in the following list of indicator items which you think most influence the adoption of preventive behaviours against HIV infection among secondary schools students in Njombe region. Studentsô beliefs of:

1) Receiving social supportive socialization in school systems influence adoption of preventive behaviours against HIV infection to students..... [ ]
2) Receiving social supportive socialization in family systems influence adoption of preventive behaviours against HIV infection to student.....[ ]
3) Receiving social supportive socialization in church /mosque systems influence adoption of preventive behaviours against HIV infection to students..... [ ]
4) Receiving social supportive counselling in health care systems influence adoption of preventive behaviours against HIV infection to students..... [ ]
5) Receiving social supportive socialization in peer group systems influence adoption of preventive behaviours against HIV infection to students.....[ ]
6) Traditional healers influence adoption of preventive behaviours against HIV infection to students.....[ ]
7) Structure of nuclear family influence adoption of preventive behaviours against HIV infection to students..... [ ]
8) Receiving counselling supervision services influence adoption of preventive behaviours against HIV infection to students. .....[ ]
9) Adherence to code of ethics for counselling services influence adoption of preventive behaviours against HIV infection to students..... [ ]
10) Search for self identity influence adoption of preventive behaviours against HIV infection to students..... [ ]

In question *27 to 37 tick* **any one** option only to indicate level of your ranking agreement or disagreement on each microsystems variable that may influence adoption of preventive behaviours against HIV infection among students in secondary schools in Njombe region.

	Microsystems variables that may influence adoption of preventive behaviours against HIV infection among secondary school students. Studentsô beliefs of :	Responses				
		Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
		5	4	3	2	1
27	Structure of extended family influence adoption of preventive behaviours against HIV infection to students					
28	Diversity of traditional sages influence adoption of preventive behaviours against HIV infection to students					
29	Diversity of students psychological maturity depending on age influence adoption of preventive behaviours against HIV infection to students					
30	Diversity of biological characteristics of individual influence adoption of preventive behaviours against HIV infection to students					
31	Diversity of languages influence adoption of preventive behaviours against HIV infection to students					
32	Diversity networking between school and family influence adoption of preventive behaviours against HIV infection to students.					
33	Diversity of networking between schools and church/mosques influence adoption of preventive behaviours against HIV infection to students					
34	Diversity of networking between school and health care systems influence adoption of preventive behaviours against HIV infection to students					
35	Level of networking between school and peer group influence adoption of preventive behaviours against HIV infection among students.					
36	Level of networking between school and sportsô club influence adoption of preventive behaviours against HIV infection among students.					
37	Religiousity faith influence adoption of preventive behaviours against HIV infection among students.					

Section four: Exosystems variable

38 Please tick ***any one*** **item of exosystem** variable in the following list of indicator items which you think most influence adoption of preventive behaviours against HIV infection among students in secondary schools in Njombe region. Studentsô beliefs of:

1) Accessibility to televisionôs messages influence adoption of preventive behaviors against HIV infection among secondary school studentsé é é é é é .....é é .....[ ]
2) Accessibility to internetôs messages influence adoption of preventive behaviors against HIV infection among secondary school studentsé é é é é é é . [ ]
3) Accessibility to radio messages influence adoption of preventive behaviors against HIV infection among secondary school studentsé é é é é é é [ ]
4) Accessibility to print mediaôs messages influence adoption of preventive behavior s against HIV infection among secondary school students é é é é .....[ ]
5) Using drama to advocate and communicate messages for adoption of preventive behavior s against HIV infection among secondary school studentsé é .. [ ]
6) Using academic debates for advocating adoption of preventive behaviors against HIV infection among secondary school studentsé é é é é é .... [ ]
7) Compliancebility to policy that enhance adoption of preventive behaviours against HIV infection among secondary school studentsé é é é é é .... [ ]
8) Promoting responsive systems change in schools influence adoption of preventive behavior s against HIV infection among secondary school students é é ..é ..é .....[ ]
9) Fostering responsive systems changes in families influence adoption of preventive behaviors among secondary school studentsé é é é é é ..é .[ ]
10) Promoting responsive legal service changes in schools influence adoption of preventive behavior s against HIV infection among secondary school studentsé .....[ ]

In questions *39* to *50 tick* ***any one*** option only to indicate level of your ranking agreement or disagreement on each exosystems variable that may influence the adoption of preventive behaviours against HIV infection among students in secondary schools in Njombe region.

	Exosystems variables that may influence adoption of preventive behaviour against HIV infection. Studentsô beliefs of :	Responses				
		Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
		5	4	3	2	1
39	Receiving positive reinforcements as consequence of adoption of preventive behaviours against HIV infection to students					
40	Receiving negative reinforcements as consequence of non adoption of preventive behaviours against HIV infection to students .					
41	Receiving psychological punishments as consequence of failure to adopt preventive behaviours against HIV infection to students.					
42	Using ethical desirable language in delivering information on preventive behaviours against HIV infection to students					
43	Promoting responsive safety social welfare services influence adoptions of preventive behaviours against HIV infection to students.					
44	Pleasant context for receiving knowledge on preventive behaviours against HIV infection to students					
45	Use of transparency style in advocating and receiving knowledge on preventive behaviours against HIV infection to students .					
46	Receiving adequate quality content of knowledge on preventive behaviours against HIV infection to students					
47	Using moderate fear arousal in communicating knowledge on preventive behaviours against HIV infection to students.					
48	Using humour in advocating information for adoptions of preventive behaviours against HIV infection to students.					
49	Credibility of channels used to transmits message on preventive behaviours against HIV infection to students.					
50	Complianceability of students to adopt preventive behaviours against HIV infection to students.					

Thanks much for your cooperation

APPENDIX B: Interview guide for focused group discussion.

Dear students, I am conducting a study on:

Psychosocial determinants on adoption of preventive behaviours against HIV infection among Secondary School students in Njombe region, Tanzania.

Instructions:

Part one: socio- demographic data.

1. Respondentôs gender: (1) Maleé é é ..é [ ] (2) Femaleé é é é é . [ ]
2. Respondentôs age in years é é é é é é é é é é é é é é é é
3. Respondentôs education level (1) Form I-IV é ..[ ] (2) Form V-VI.é [ ]
4. Respondentôs religion affiliation: (1) Christiané .. [ ], (2) Muslimé é [ ]

Part two: Preventive behaviours against HIV infection among secondary school students in Njombe region:

5. Knowledgeability on preventive behaviours
   - 5.1. Meaning of preventive behaviours against HIV infection among Secondary School students.
   - 5.2. Examples of preventive behaviours against HIV infections.
   - 5.3. Utilization of preventive behaviours.
   - 5.4. Sources of information for preventive behaviours
   - 5.5. Credibility of sources and message for preventive behaviours

6.0. History of practicing preventive behaviors against HIV infection among Students in secondary schools in Njombe region.

- 6.1. Practicing sexual abstinence in last one year. Give reasons.
- 6.2. Not practicing sexual abstinence in last one year. Give reasons
- 6.3. Attendance to VCT services in the last one year. Give reasons.
- 6.4. Adherence to non alcoholism behaviour in the last one year. Give reasons.
- 6.5. Adherence to health care seeking behaviour.
- 6.6 Adherence to faith moral behaviours. Give reasons.

Part three: Determinants that influence the adoption of preventive behaviors against HIV infection among secondary school students in Njombe region.

7.0. Determinants:

7.1. Perception variables

Determinants related to: credibility of messages, susceptibility of clients, primacy effects of receiving message, clientsô self efficacy, and invulnerability perception to HIV infection and persuasibility.

7.2. Microsystem variables.

Determinants related to functions and socialization in families, schools, faith institutions, health care centers, peer groups, ethnic diversity and social clubs.

7.3. Exosystem variables.

Determinants related to: advocacy and systemic change in schools, family; clientsô accessibility to message from television, internet, radio, print media, drama, debates and participation in responsive safety social welfare services.

Thanks much for your Cooperation

Appendix C: Reported additional perception items determined on adoption of preventive Behaviours against HIV infection

Perception variables.	Sex	sa %	a %	un %	d %	sd %	df	rho	P-value
Use of logical argument in counselling and delivering message on preventive behaviours.	F	36	20.60	20.40	8.5	14.50	5	0.90	0.001
	M	30.50	21.40	20.10	13.00	15.00			
Systematic repetition rate of counselling and receiving preventive message	F	38.50	26.00	14.50	16.50	4.50	5	0.81	0.000
	M	29.50	19.15	18.56	20.79	12.00			
Concreteness of message delivered in advocacy to empower students to adopt preventive behaviours	F	20.43	30.25	20.10	16.42	12.80	5	0.88	0.003
	M	40.29	4.00	22.30	13.81	19.60			
Recency effects of knowledge delivered to empower students to adopt preventive behaviours	F	29.24	20.72	10.64	23.40	16.00	5	0.97	0.004
	M	27.00	17.30	15.90	16.80	23.00			
Vividness of language used to communicate message on preventive behaviours	F	33.00	22.70	22.10	12.00	10.20	5	0.72	0.000
	M	30.05	18.30	18.96	17.70	14.80			
Compatibility between previous knowledge and new health preventive behaviours	F	35.17	19.62	19.50	21.26	4.14	5	0.65	0.002
	M	28.40	19.38	19.50	17.75	14.86			
Existence of intention to adopt preventive behaviours	F	30.84	19.73	23.60	6.26	19.50	5	0.89	0.001
	M	28.08	19.27	15.41	17.75	19.50			
Exposure to counselling services on preventive behaviours	F	38.00	17.78	16.73	19.25	7.80	5	0.75	0.004
	M	34.94	21.22	22.27	9.95	11.20			
Attention to knowledge content on preventive behaviours	F	36.29	17.75	20.71	17.32	7.80	5	0.62	0.002
	M	28.06	21.26	18.29	21.68	10.05			
Acquisition and comprehension of knowledge on preventive behaviours	F	31.93	20.16	22.85	15.60	9.25	5	0.93	0.001
	M	31.38	18.84	16.15	23.40	9.75			
Deep synthesis of knowledge on health preventive behaviours against HIV infection to students	F	25.61	20.36	21.22	18.49	13.99	5	0.60	0.005
	M	27.93	18.64	17.78	20.51	15.02			

Appendix C Continue...

Perception variables.	Sex	sa %	a %	un %	d %	sd %	df	rho	P-value
Concentrations to counselling information on preventive behaviours against HIV infection to students.	F	38.87	18.60	19.93	3.40	19.00	5	0.75	0.003
	M	25.48	20.40	19.07	15.60	19.20			
Rehearsal on knowledge of preventive behaviours against HIV infection to students	F	40.04	19.31	19.73	6.01	14.86	5	0.82	0.002
	M	33.95	19.70	19.27	12.99	14.14			
Consistent counselling of information on preventive behaviours against HIV infection to students	F	35.06	22.74	4.53	18.76	18.88	5	0.63	0.000
	M	29.11	16.26	14.47	20.24	19. 7			
Reliability quality of information on preventive behaviours against HIV infection to students	F	39.65	9.62	2.11	14.86	13.5	5	0.94	0.000
	M	35.91	19.38	16.89	24.14	03.5			
Validity quality of information of preventive behaviours against HIV infection to students	F	32.76	27.71	15.86	5.51	18.00	5	0.89	0.002
	M	32.96	31.29	13.14	13.49	9.09			

Level of significance is ,p < 0.05 level, two tailed test.

Key: Likert scale: sa = strongly agree, a = agree, un = uncertain, d= disagree, sd = strongly disagree, df = degree of freedom, rho= Spearman rank oder correlation coefficient.

Appendix D: Reported additional microsystem items determined on adoption of preventive Behaviours against HIV infection

Microsystem variables.	Sex	sa %	a %	un %	d %	sd %	df	rho	P-value
Structure of extended family influence adoption of preventive behaviours	F	26.0	20.32	19.62	17.12	17.4	5	0.91	0.003
	M	33.00	18.68	19.38	8.16	20.5			
Diversity of traditional sages influence adoption of preventive behaviours	F	29.43	19.89	19.50	15.80	15.2	5	0.89	0.004
	M	27.05	19.11	19.50	23.21	10.5			
Diversity of students psychological maturity depending on age influence adoption of preventive behaviours	F	25.35	19.81	19.50	18.41	16.7	5	0.88	0.003
	M	39.4	19.00	15.50	5.00	21.05			
Diversity of biological characteristics of individual influence adoption of preventive behaviours	F	30.86	19.19	19.03	16.15	14.5	5	0.60	0.000
	M	39	19.81	19.97	7.85	13.2			
Diversity of languages influence adoption of preventive behaviours	F	43.69	17.47	15.44	05	18	5	0.78	0.022
	M	32.06	21.53	18.56	7.85	20.0			
Diversity networking between school and family influence adoption of preventive behaviours	F	37.37	20.48	15.76	18.56	7.5	5	0.85	0.001
	M	25	28.53	13.24	20.44	12.5			
Diversity of networking between schools and church/mosques influence adoption of preventive behaviours	F	31.27	20.51	22.66	18.49	6.6	5	0.66	0.000
	M	33.0	28.49	16.34	10.51	11.6			
Diversity of networking between school and health care systems influence adoption of preventive behaviours	F	38.03	19.38	17.98	14.43	10.0	5	0.82	0.033
	M	35.0	34.0	14.43	10.65	5.92			
Level of networking between school and peer group influence adoption of preventive behaviours	F	27.11	21.68	18.02	17	6.10	5	0.55	0.005
	M	30	27.32	20.98	8.5	12.89			

Appendix D Continue...

Microsystem variables.	Sex	sa %	a %	un %	d %	sd %	df	rho	P-value
Level of networking between school and sportsô club influence adoption of preventive behaviours	F	37	29.42	13.21	10.79	9.5	5	0.79	0.002
	M	40.26	19.58	15.80	12.21	12.02			
Religiosity faith influence adoption of preventive behaviours	F	40.5	20.20	15	13	11.2	5	0.78	0.004
	M	35.04	18.80	18.17	17.86	10.0			

Level of significance is, p. < 0.05 level, two tailed test.

Key: Likert scale: sa = strongly agree, a = agree, un = uncertain, d= disagree, sd = strongly disagree, df = degree of freedom, rho = Spearman rank oder correlation coefficient.

Appendix E: Reported additional exosystem items determined on adoption of preventive Behaviours against HIV infection

Exosystem variables.	Sex	sa %	a %	un %	d %	sd %	df	rho	P-value
Receiving positive reinforcements as consequence of adoption of preventive behaviours	F	39.48	19.77	10.26	19.93	10.50	5	0.75	0.002
	M	34.00	19.23	17.98	19.07	9.50			
Receiving negative reinforcements as consequence of non adoption of preventive behaviours	F	30.98	31.37	19.93	9.66	7.8	5	0.83	0.001
	M	33.55	17.63	19.07	19.34	10.00			
Receiving psychological punishments as consequence of failure to adopt preventive behaviours	F	32.76	18.92	18.41	10.0	19.77	5	0.76	0.002
	M	31.76	28.92	18.41	11.00	9.77			
Promoting responsive safety social welfare services influence adoptions of preventive behaviours	F	32.32	19.73	16.50	16.26	15	5	0.90	0.004
	M	32.18	19.27	22.50	12.74	13.00			
Pleasant context for receiving knowledge on preventive behaviours	F	36.87	18.56	13.4	15.60	15.1	5	0.78	0.000
	M	37.26	20.44	15.60	13.4	13.4			
Use of transparency style in advocating and receiving knowledge on preventive behaviours	F	51.49	19.50	10.00	11.00	8.00	5	0.63	0.003
	M	50.49	19.00	13.42	13.00	4.3			

Appendix E Continue...

Exosystem variables.	Sex	sa %	a %	un %	d %	sd %	df	rho	P-value
Receiving adequate quality content of knowledge on preventive behaviours	F	37.19	18.88	10.65	11.65	21.3	5	0.93	0.006
	M	37.53	20.12	8	17	17			
Using moderate fear arousal in communicating knowledge on preventive behaviours	F	38.67	18.7	19.5	13.0	10.05	5	0.89	0.010
	M	35.99	21.7	8.45	15.83	18.00			
Using humour in advocating information for adoption of preventive behaviours	F	25.99	21.10	18.45	15.83	18.6	5	0.77	0.000
	M	37.71	28.02	11.96	14.63	7.50			
Credibility of channels used to transmit message on preventive behaviours	F	38.35	29.85	12.00	10	9.50	5	0.66	0.000
	M	36.37	29.15	17.00	8.02	9			
Compliance ability of students to adopt preventive behaviours	F	32.39	28.76	18.76	9.09	11.00	5	0.90	0.005
	M	33.39	20.24	20.24	18.60	7.5			

Level of significance is 0.05 levels, two tailed test.
Key: Likert scale: sa = strongly agree, a = agree, un = uncertain, d= disagree, sd = strongly disagree, df = degree of freedom, rho = Spearman rank oder correlation coefficient.

Appendix F: Prediction of psychosocial determinants on adoption of preventive Behaviours against HIV infection, in terms of multivariate regression analysis

Components of psychosocial determinants:	Multiple R	R^2	R-adjusted	Beta (س)	p- value
Perception, Microsystem and Exosystem independent variables.	0.85	0.72	0.58	0.63	0.001

Level of significance, $p < 0.05$ two tailed test

Appendix G: Prediction of psychosocial determinants on adoption of preventive behaviours against HIV infection in terms of multivariate logistic regression analysis

Components of psychosocial determinants:	Multiple R	R^2	R-adjusted	Beta (س)	p- value
Perception, Microsystem and Exosystem independent variables.	0.76	0.60	0.65	0.59	0.001

Level of significant, $p < 0.05$ two tailed test

APPENDIX H: RESEARCH CLEARANCE DOCUMENTS

THE OPEN UNIVERSITY OF TANZANIA

JAMHURI YA MUUNGANO WA TANZANIA
OFISI YA WAZIRI MKUU – TAWALA ZA MIKOA NA SERIKALI ZA MITAA
HALMASHAURI YA WILAYA YA WANGING'OMBE
(MawasilianoyoteyafanywekupitiakwaMkurugenziMtendajiwaWilaya)

S.L.P 64
NJOMBE

Kumb.Na. WDC/D.30/24/43 07/11/2016

Wakuu wa Shule,
Shule za Sekondari:-

1. Kidugala Seminary,
2. Mt. Kipengere Sekondari,
3. Makoga Sekondari.

YAH: UTAMBULISHO WA NDUGU APIUM LAMECK CHENGULA KUFANYA UTAFITI

Kichwa hicho hapo juu chahusika.

Mtajwa hapo juu ni Mwanafunzi wa Chuo Kikuu Huria cha Tanzania ambaye anakuja kwako kufanya utafiti wa andiko lake lenye somo la **"psychosocial determinants of preventive behaviors against HIV infection among Secondary School Students in Njombe Region, Tanzania".**

Tafadhali umpokee na kumpa ushirikiano ili aweze kufanya utafiti kwenye eneo lako kuanzia tarehe 01 Septemba, 2016 hadi 31 Desemba,2016.

Naomba kuwasilisha,

LOYCE MGONJA
Kny: **MKURUGENZI MTENDAJI**
HALMASHAURI YA WILAYA
WANGING'OMBE.

KNY MKURUGENZI MTENDAJI
HALMASHAURI YA WILAYA WANGING'OMBE

Nakala: Prof. Hossea Rwegoshora,
Kny: Makamu Mkuu wa Chuo (OUT)
S.L.P. 23409
DAR ES SALAAM.

: : Apium Lameck Chengula
Mwanafunzi wa Chuo Kikuu Huria cha Tanzania – Tafadhali ripoti katika shule husika

APPENDIX VI

THE OPEN UNIVERSITY OF TANZANIA.

DIRECTORATE OF RESEARCH, PUBLICATIONS AND POST GRADUATE STUDIES.

P.o. Box 23409 Dar-Es-Salaam, Tanzania.

Tel.255-22266752/2668445.

drpc@out.ac.tz

http://www.out.ac.tz.

DECLARATION OF CONFIDENTIALITY

To: The Regional Administrative Secretary of Njombe Region. I, Apium Lameck Chengula, Reg. No. HD/E/223/T.09, of the Department of Psychology and Special education, The Open University of Tanzania, declare that, i will maintain secrecy and confidentiality, and i will not use any data and information obtained from your organization in the course of my research for any purpose other than for my academic endeavors.

Signature.....(student) Date.30/08/2016

Counter signed by

Name.Dr Wycliffe Lugoe.....(supervisor)

Signature.....(supervisor). Date.31 August 2016

APPENDIX: I. Candidates' publication documents.

(i) ***Chengula, A.L. (2008).*** Psychosocial Barries to Parent- Youth Communication on HIV/AIDS .Prevention and Reproductive Health:A Case study of Magugu Community,Babati,Manyara Region, Tanzania.. *Papers in Education and Development. Journal of the Faculty of Education. University of Dar es Salaam, 28, 83-101.*

(ii) Malima, W .A, & **Chengula, A**. *L. (2011*). Psychosocial Factors Contributing to Industrial Conflicts in Organizations: A case study of Mwanza City Council. *Kivukoni Journal. A Journal of The Mwalimu Nyerere Memorial Academy*, 1 (1), 40-59.

(iii) **Chengula, A.L** & Losioki, B.E ***(2015).*** Communication barriers to HIV/AIDS Counseling among Adolescents in secondary schools in Kinondoni Municipality, Dar es Salaam Region. *Kivukoni Journal. A Journal of The Mwalimu Nyerere Memorial Academy, 3* (1). 27-38.

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(i) ***Chengula, A.L. (2008).*** Psychosocial Barries to Parent- Youth Communication on HIV/AIDS Prevention and Reproductive Health:A Case study of Magugu Community,Babati,Manyara Region, Tanzania.. *Papers in Education and Development. Journal of the Faculty of Education.University of Dar es Salaam, 28, 83-101.*

(ii) Malima, W .A, & **Chengula, A**. *L. (2011*). Psychosocial Factors Contributing to Industrial Conflicts in Organizations: A case study of Mwanza City Council. *Kivukoni Journal. A Journal of the Mwalimu Nyerere Memorial Academy*, 1 (1), 40-59.

(iii) **Chengula, A.L** & Losioki, B.E ***(2015).*** Communication barriers to HIV/AIDS Counseling among Adolescents in secondary schools in Kinondoni Municipality, Dar es Salaam Region. *Kivukoni Journal. A Journal of the Mwalimu Nyerere Memorial Academy, 3*(1). 27-38.